

GROUP 23Aa

AUTOMATIC TRANSMISSION

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WARNINGS REGARDING SERVICING OF SUPPLEMENTAL RESTRAINT SYSTEM (SRS) EQUIPPED VEHICLES

WARNING

- *Improper service or maintenance of any component of the SRS, or any SRS-related component, can lead to personal injury or death to service personnel (from inadvertent firing of the air bag) or to the driver and passenger (from rendering the SRS inoperative).*
- *Service or maintenance of any SRS component or SRS-related component must be performed only at an authorized MITSUBISHI dealer.*
- *MITSUBISHI dealer personnel must thoroughly review this manual, and especially its GROUP 52B - Supplemental Restraint System (SRS) before beginning any service or maintenance of any component of the SRS or any SRS-related component.*

NOTE

The SRS includes the following components: SRS air bag control unit, SRS warning light, front impact sensors, air bag module, clock spring, and interconnecting wiring. Other SRS-related components (that may have to be removed/installed in connection with SRS service or maintenance) are indicated in the table of contents by an asterisk (*).

GENERAL DESCRIPTION

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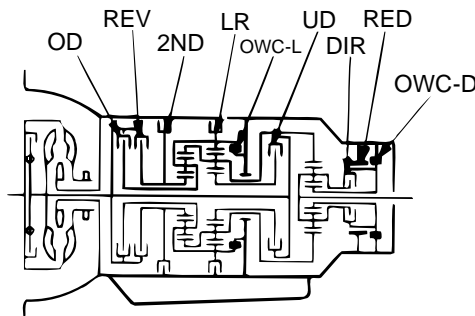
The automatic transmission comes in one model V5A51.

ITEM		SPECIFICATION
Model		V5A51
Engine		6G75 (3.8L Engine)
Torque converter type		With torque converter clutch
Transmission type		Electronically controlled 5-speed full automatic
Control elements	Clutch	Multiple disc type 4 sets
	Brake	Multiple disc type 2 sets, band type 1 set
	One-way clutch	Sprag type 2 set
Gear ratio	1st gear	3.789
	2nd gear	2.057
	3rd gear	1.421
	4th gear	1.000
	5th gear	0.731
	Reverse gear	3.865
Oil pump type		Gear type
Oil cooling system		Water-cooled type
Transfer type		Active Track 4WD II
Shift ratio	High	1.000
	Low	1.900

TRANSMISSION

The transmission is made up of the torque converter and gear train. A 3-element, 1-step, 2-phase torque converter with built-in torque converter clutch is used. The gear train of the V5A51 transmission made up of four sets of multiple disc clutches, two sets of multiple disc brakes, one set of band brake, two set of one-way clutch and three sets of planetary carriers.

TRANSMISSION CONFIGURATION DRAWING



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COMPONENTS AND FUNCTIONS

COMPONENT		FUNCTION
Underdrive clutch	UD	connects the input shaft to the underdrive sun gear.
Reverse clutch	REV	connects the input shaft to the reverse sun gear.
Overdrive clutch	OD	connects the input shaft to the overdrive planetary carrier.
Direct clutch	DIR	connects the direct sun gear to the direct planetary carrier
Low-reverse brake	LR	holds the low-reverse annulus gear and the overdrive planetary carrier.
Second brake	2ND	holds the reverse sun gear.
Reduction brake	RED	holds the direct sun gear.
One-way clutch (Low-reverse brake)	OWC-L	controls rotation direction of the low-reverse annulus gear.
One-way clutch (Direct clutch)	OWC-D	controls rotation direction of the direct sun gear.

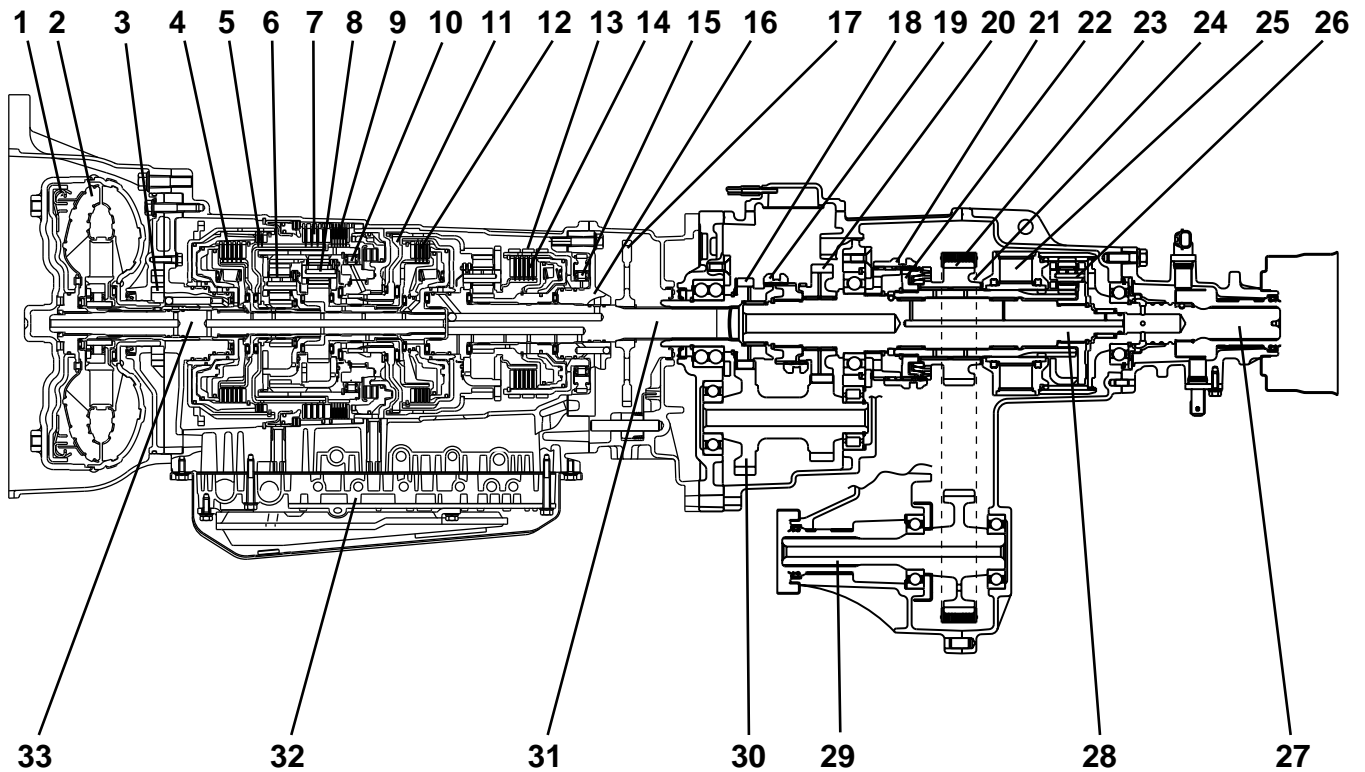
FUNCTION ELEMENT TABLE

OPERATING ELEMENT		ENGINE START	PARKING MECHANISM	UNDER-DRIVE CLUTCH (UD)	REVERSE CLUTCH (REV)	OVERDRIVE CLUTCH (OD)	DIRECT CLUTCH (DIR)	LOW-REVERSE BRAKE (LR)	SECOND BRAKE (2ND)	REDUCTION BRAKE (RED)	ONE-WAY CLUTCH (OWC-L)	ONE-WAY CLUTCH (OWC-D)
TRANSMISSION RANGE												
P	Parking	OK	X	-	-	-	-	X	-	X	-	-
R	Reverse	-	-	-	X	-	-	X	-	X	-	-
N	Neutral	OK	-	-	-	-	-	X	-	X	-	-
D	1st	-	-	X	-	-	-	X*	-	X	X	X
	2nd	-	-	X	-	-	-	-	X	X	-	X
	3rd	-	-	X	-	X	-	-	-	X	-	X
	4th	-	-	X	-	X	X	-	-	-	-	-
	5th	-	-	-	-	X	X	-	X	-	-	-
SPORT MODE	1st	-	-	X	-	-	-	X	-	X	X	X
	2nd	-	-	X	-	-	-	-	X	X	-	X
	3rd	-	-	X	-	X	-	-	-	X	-	X
	4th	-	-	X	-	X	X	-	-	-	-	-
	5th	-	-	-	-	X	X	-	X	-	-	-

• × : Function element

• Item marked with an * operate only when stopped [approximately 10 km/h (6.2mph) or less].

SECTIONAL VIEW



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- | | |
|--------------------------------|-------------------------------|
| 1. TORQUE CONVERTER CLUTCH | 18. TRANSFER INPUT GEAR |
| 2. TORQUE CONVERTER | 19. H-L CLUTCH |
| 3. OIL PUMP | 20. LOW SPEED GEAR |
| 4. OVERDRIVE CLUTCH | 21. DIFFERENTIAL LOCK HUB |
| 5. REVERSE CLUTCH | 22. 2-4WD SYNCHRONIZER SLEEVE |
| 6. OVERDRIVE PLANETARY CARRIER | 23. DRIVE SPROCKET |
| 7. SECOND BRAKE | 24. CHAIN |
| 8. OUTPUT PLANETARY CARRIER | 25. VISCOUS COUPLING |
| 9. LOW-REVERSE BRAKE | 26. CENTER DIFFERENTIAL |
| 10. ONE-WAY CLUTCH | 27. REAR OUTPUT SHAFT |
| 11. CENTER SUPPORT | 28. TRANSFER DRIVE SHAFT |
| 12. UNDERDRIVE CLUTCH | 29. FRONT OUTPUT SHAFT |
| 13. DIRECT CLUTCH | 30. TRANSFER COUNTER GEAR |
| 14. REDUCTION BRAKE BAND | 31. OUTPUT SHAFT |
| 15. ONE-WAY CLUTCH | 32. VALVE BODY |
| 16. OUTPUT SHAFT SUPPORT | 33. INPUT SHAFT |
| 17. PARKING GEAR | |

ELECTRONICALLY-CONTROLLED SYSTEM

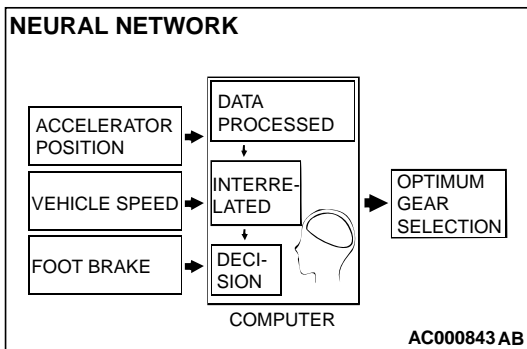
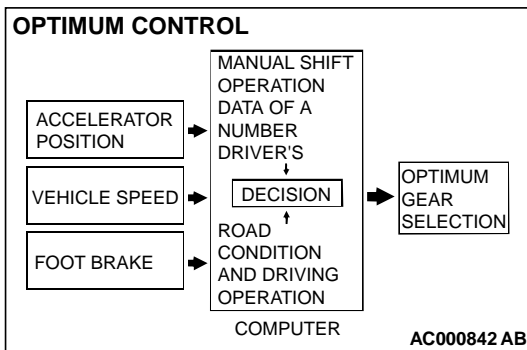
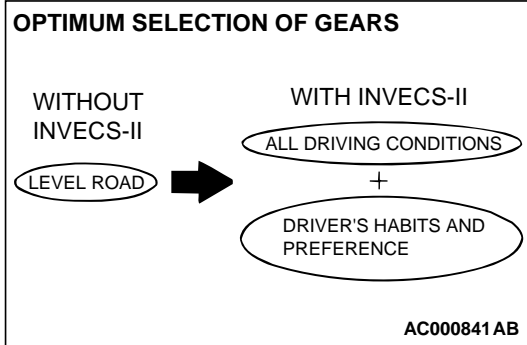
INVECS-II

- When in drive ("D" range), the new automatic transmission employs an innovative shift schedule to provide a high level of comfort and "easy driving style" that matches all driving conditions as well as the driver's driving style.
- INVECS-II features "Optimum Shift Control," which provides shift timing the average driver perceives to be the optimum timing under any road conditions "Adaptive Shift Control" adjusts shift timing to match the driving habits and preferences of individual drivers.

FEATURES

OPTIMUM SHIFT CONTROL

1. The shift patterns found satisfying by the typical driver for all ranges of driving are stored in the computer's memory. The computer uses this data to analyze road conditions and the driver's style of operation, and then outputs the optimal shift patterns stored in its memory to best match the conditions.
2. We introduce the latest in control technologies with an innovative new algorithm called the "neural network" that works to imitate the decision-making processes of the human brain. The neural network links a wide variety of input data regarding road and operating conditions, and instantly makes accurate shift control decisions.

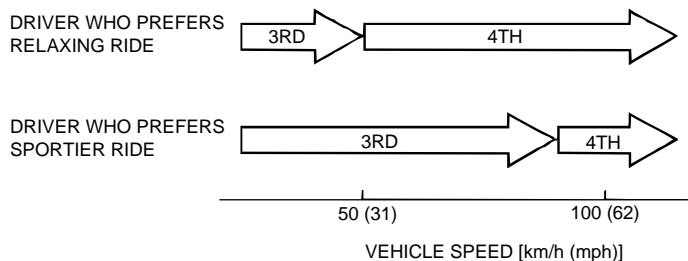


ADAPTIVE SHIFT CONTROL

1. The computer learns the driving habits and preferences of each individual driver by processing driving data on engine output, tire load, foot brake operation, etc. It then uses this data to adjust shift timing to best suit the driver's style.

2. If the computer determines from the driving patterns that the driver is one who enjoys a relaxed, unhurried style, it adjusts timing to execute up-shifts at a lower engine speed to provide a smooth, quiet ride. On the other hand, if the computer determines the driver to prefer a sporty ride, it adjusts timing to shift up at a higher engine speed to provide more powerful response.

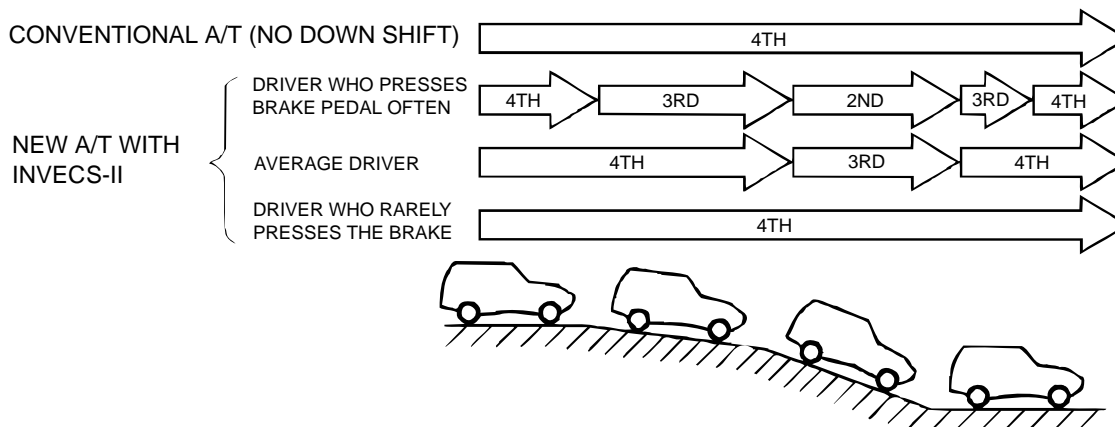
ADAPTIVE SHIFT CONTROL DURING ACCELERATION



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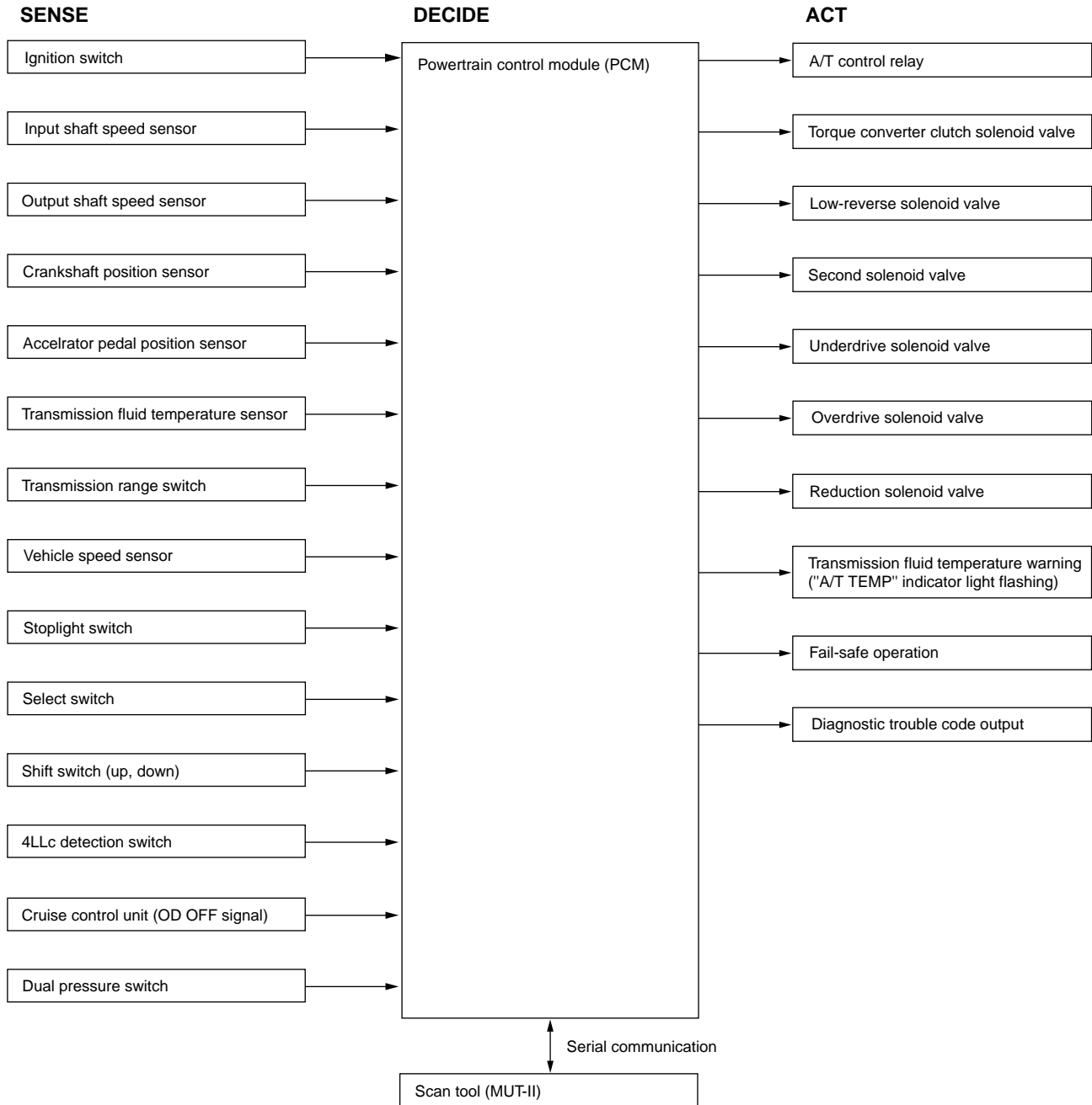
3. If the computer determines that the driver tends to apply the brakes often on a descending roadway, it adjusts timing to downshift sooner so that engine braking is more effectively applied. Conversely, if the computer determines that the driver does not brake much while driving downhill, it delays downshifting to minimize the effect of engine braking.

ADAPTIVE SHIFT CONTROL ON DOWNGRADES



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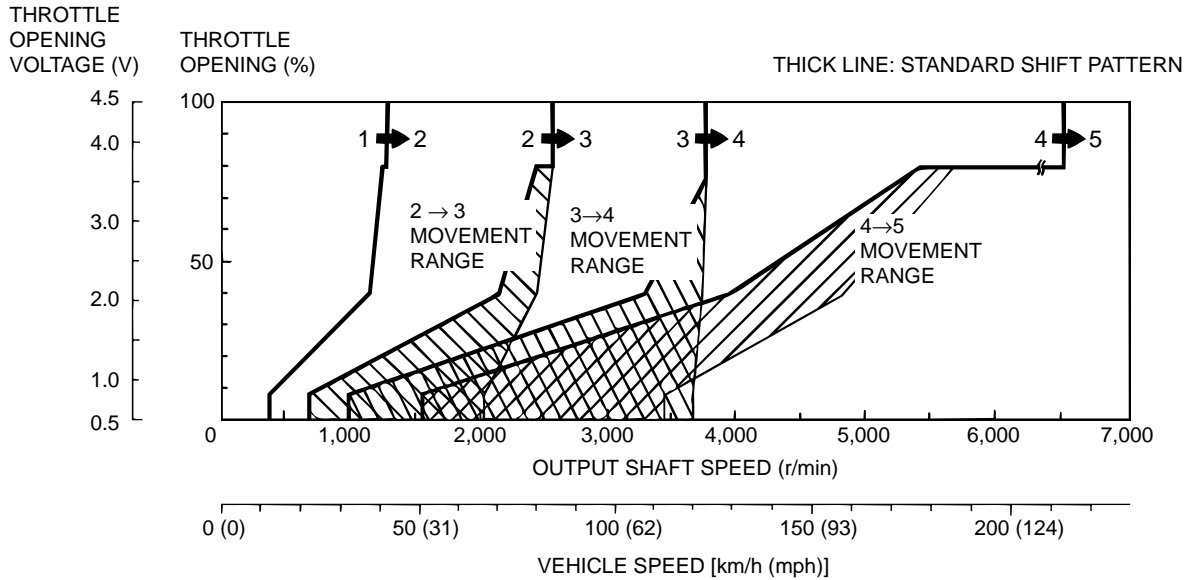
SYSTEM CONSTRUCTION DIAGRAM



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SHIFT PATTERN CONTROL

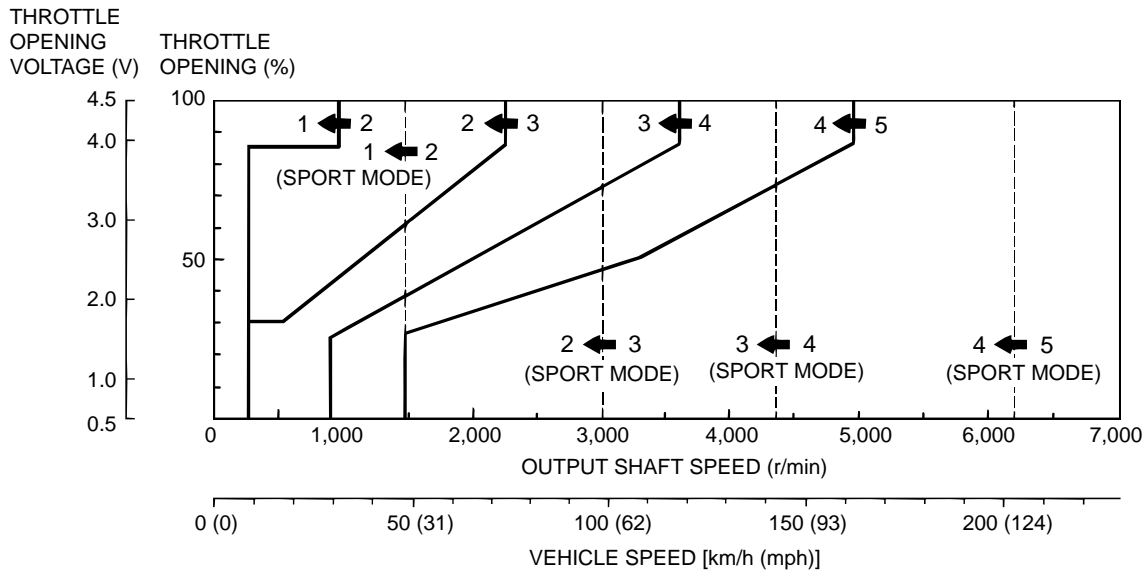
UPSHIFT PATTERN



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NOTE: Within 2-to-3 and 3-to-4 movement ranges, the PCM adjusts shift points according to the driving conditions by memorizing the accelerator pedal stroke and braking timing.

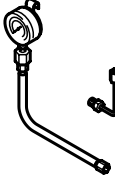
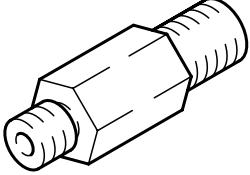

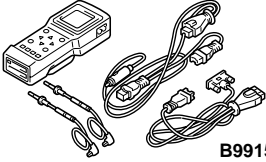
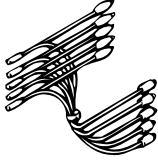

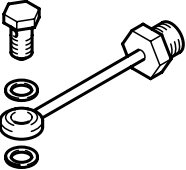
DOWNSHIFT PATTERN

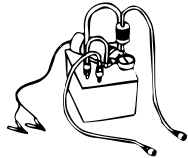
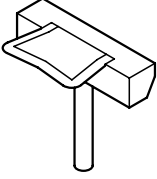
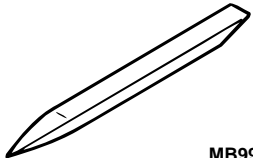


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SPECIAL TOOLS

M1231100600142

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
	MD998330 (Includes MD998331) Oil pressure gauge (3.0 MPa, 427 psi)	MD998330-01	Measurement of hydraulic pressure
	MD998332 Adapter	MD998332-01	Connection for oil pressure gauge
	MD998478 Test harness (3 pin, triangle)	MD998478-01	Inspection using an oscilloscope
 B991502	MB991502 Scan tool (MUT-II)	MB991496-OD	Checking diagnostic trouble codes
 MB991658	MB991658 Test harness set	Tool not available	Inspection of throttle position sensor
	MB991709 Test harness set	Tool not available	Inspection using an oscilloscope
	MD998900 Adapter	MD998900-01	Connection for oil pressure gauge

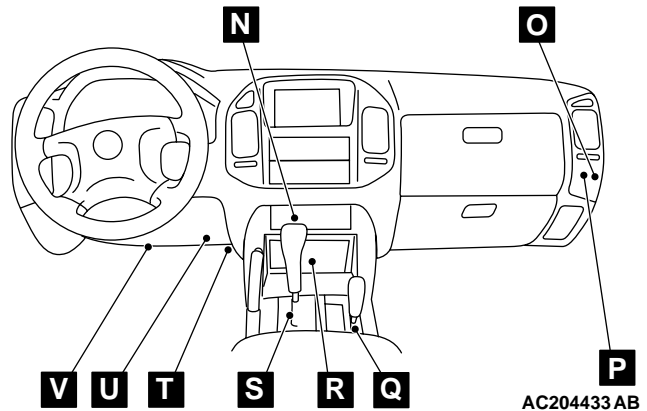
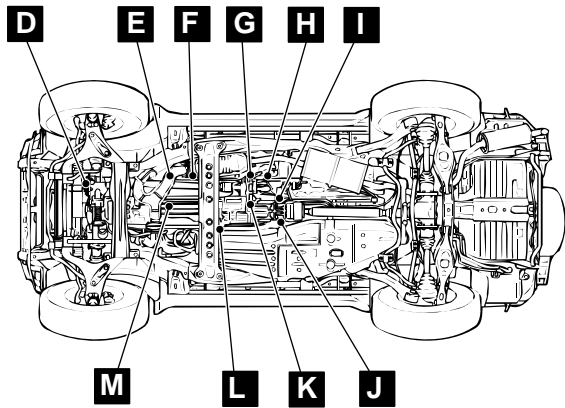
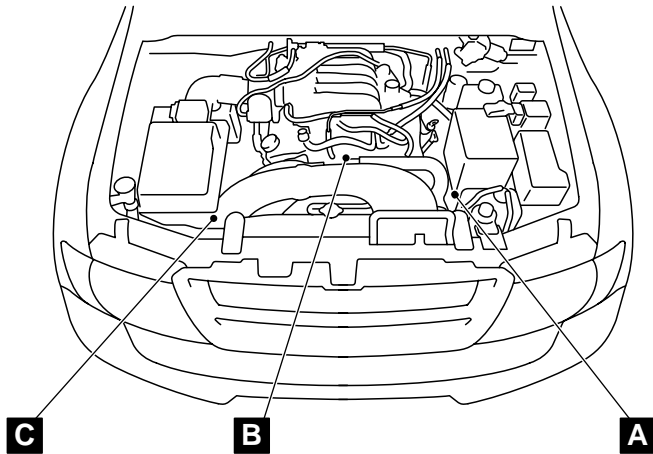
TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
	MB995062 Flushing tool	MLR-6906C or equivalent	Flushing cooler and tube
 D998727	MD998727 Oil pan remover	MD998727-01	Removal of oil pan
 MB990784	MB990784 Ornament remover	General service tool	Removal of shift knob

ON-VEHICLE SERVICE

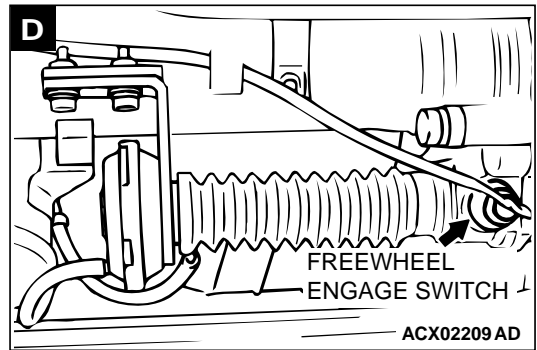
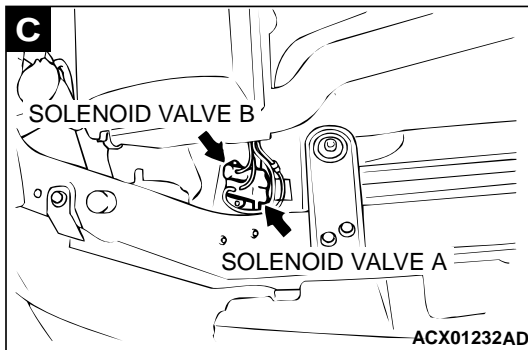
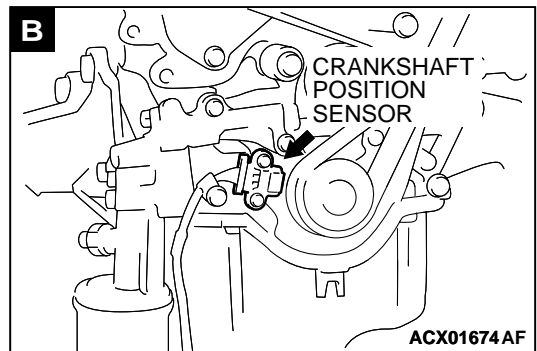
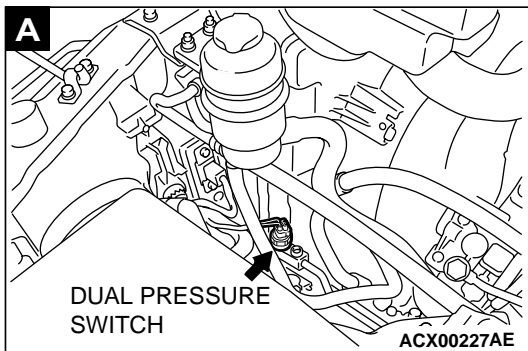
AUTOMATIC TRANSMISSION CONTROL COMPONENT LAYOUT

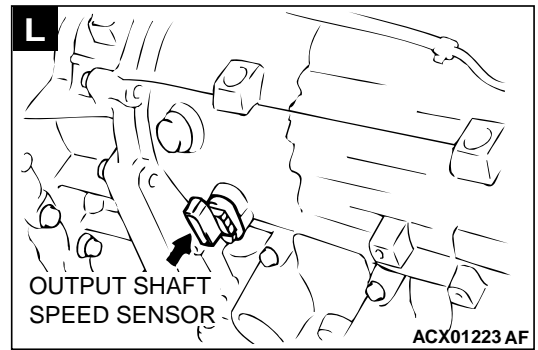
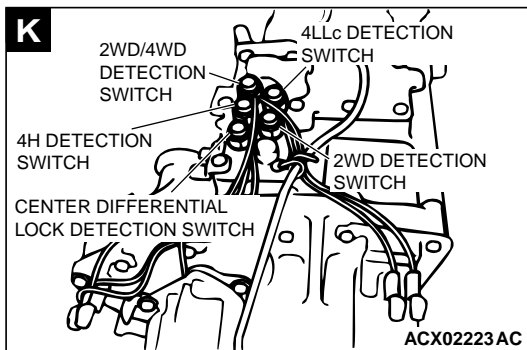
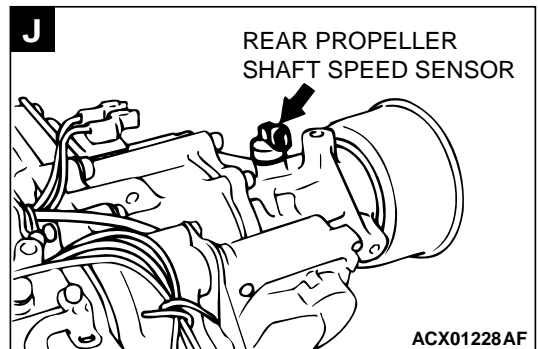
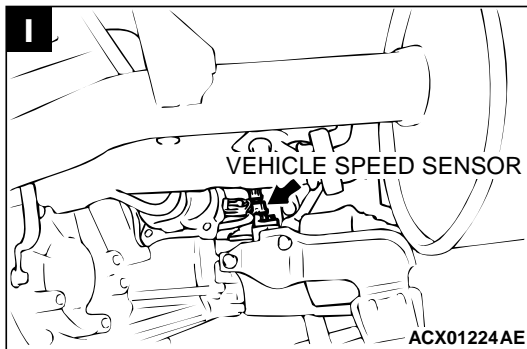
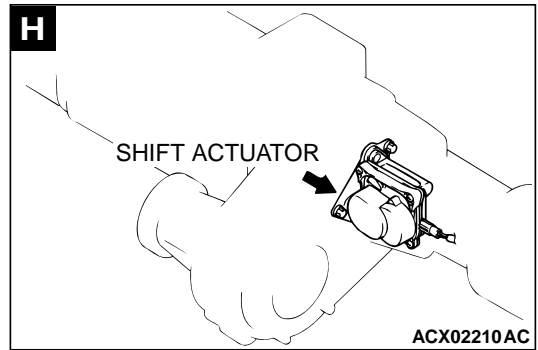
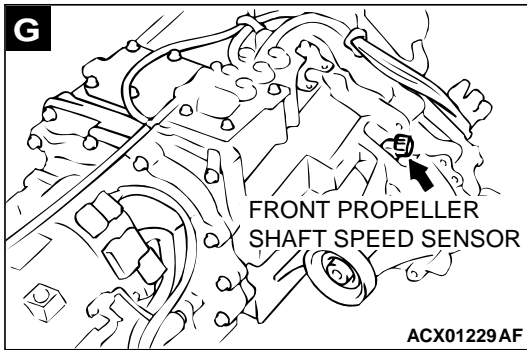
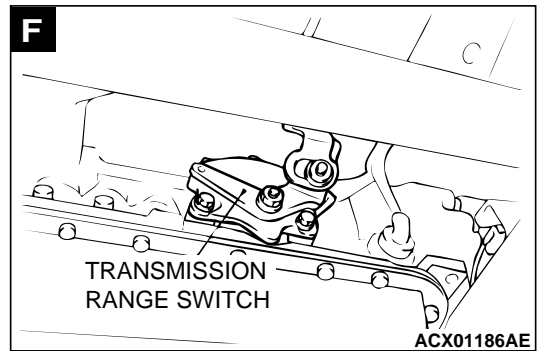
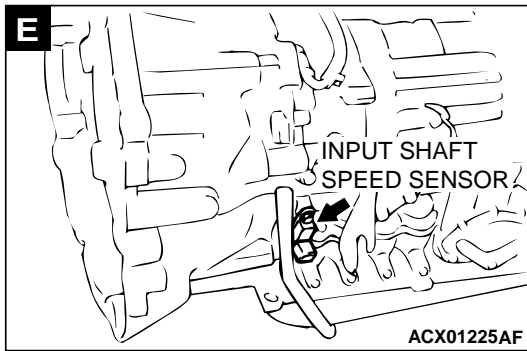
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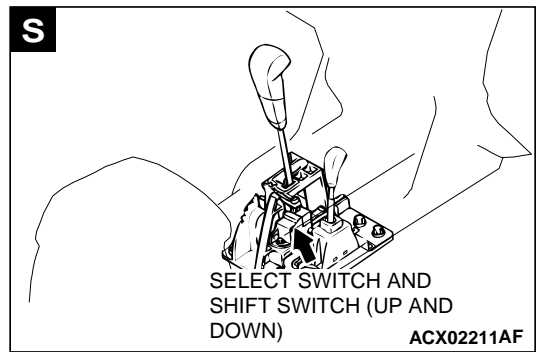
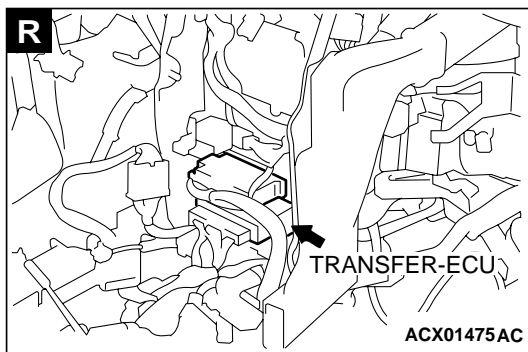
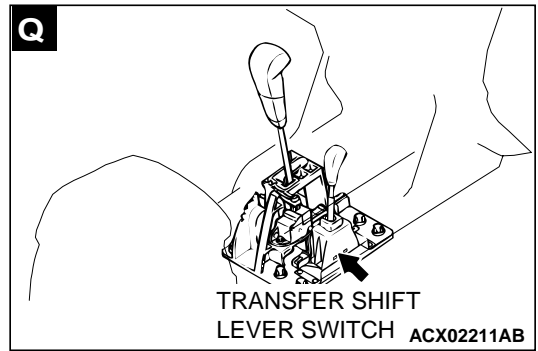
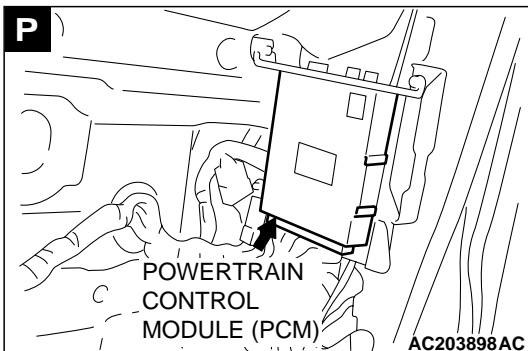
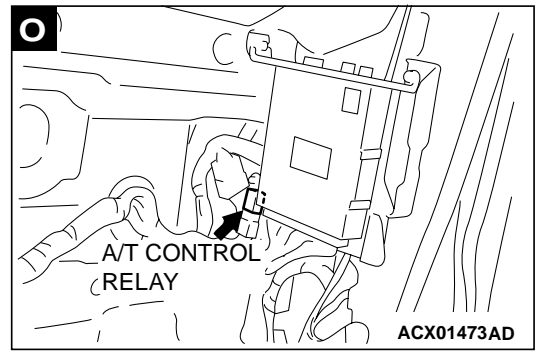
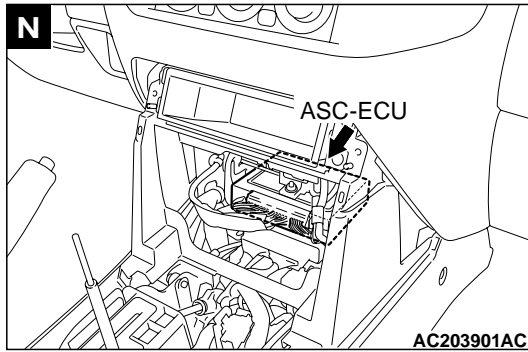
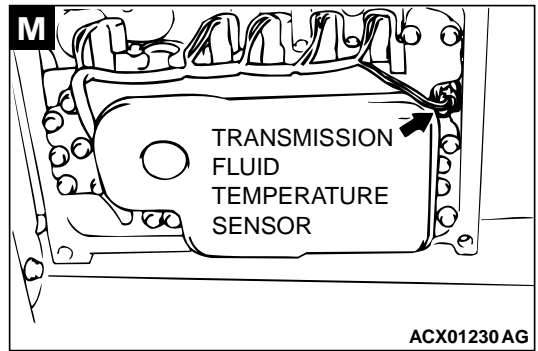
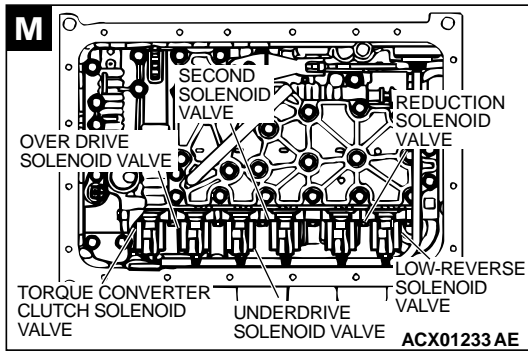
NAME	SYMBOL	NAME	SYMBOL
2WD detection switch	K	Input shaft speed sensor	E
2WD/4WD detection switch	K	Output shaft speed sensor	L
4H detection switch	K	Powertrain control module (PCM)	P
4LLc detection switch	K	Rear propeller shaft speed sensor	J
Accelerator pedal position sensor	U	Select switch	S
ASC-ECU	N	Shift actuator	H
A/T control relay	O	Shift switch (Up and down)	S
A/T control solenoid valves	M	Solenoid valves A and B	C
Center differential lock detection switch	K	Stoplight switch	V
Crankshaft position sensor	B	Transfer-ECU	R
Data link connector	T	Transfer shift lever switch	Q
Dual pressure switch	A	Transmission fluid temperature sensor	M
Freewheel engage switch	D	Transmission range switch	F
Front propeller shaft speed sensor	G	Vehicle speed sensor	I

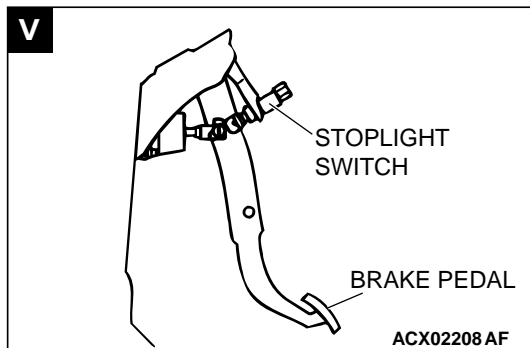
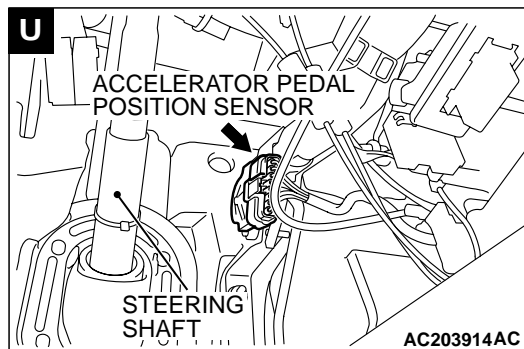
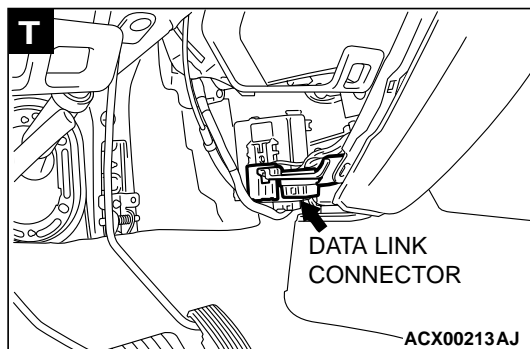


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ESSENTIAL SERVICE

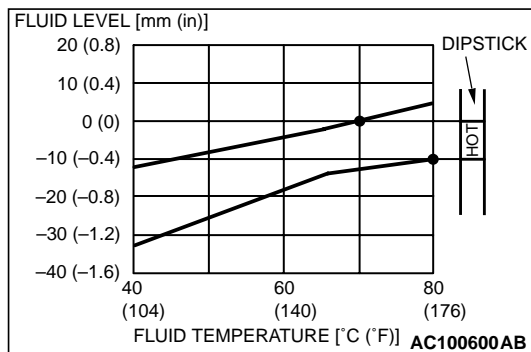
TRANSMISSION FLUID CHECK

M1231101600156

1. Drive the vehicle until the transmission fluid temperature rises to the normal temperature [70 – 80°C (158 – 176°F)].

NOTE: The transmission fluid temperature is measured with scan tool MB991502 (MUT-II).

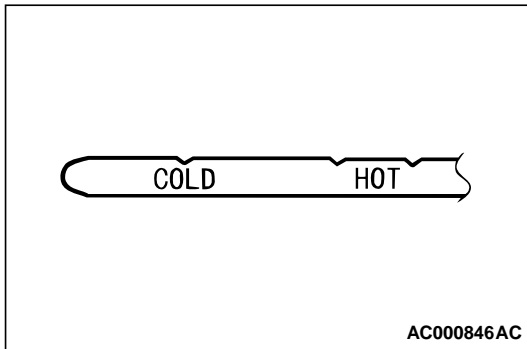
NOTE: If it takes some amount of time until the transmission fluid reaches its normal operating temperature [70 – 80 °C (158 – 176 °F)], check the transmission fluid level by referring to the left diagram.



2. Park the vehicle on a level surface.
3. Move the selector lever through all positions to fill the torque converter and the hydraulic circuits with fluid, and then move the selector lever to the "N" position.

4. After wiping off any dirt around the dipstick, remove the dipstick and check the condition of the transmission fluid.

NOTE: If the transmission fluid smells as if it is burnt, it means that the transmission fluid has been contaminated by fine particles from the bushings and friction materials. A transmission overhaul and cooler line flushing may be necessary.



5. Check that the transmission fluid level is at the "HOT" mark on the dipstick. If the transmission fluid level is less than this, add DIAMOND ATF SP III or equivalent transmission fluid until the level reaches the "HOT" mark.

NOTE: If the transmission fluid level is too low, the oil pump will draw in air along with the transmission fluid, which will cause bubbles to form. If the transmission fluid level is too high, rotating components inside the transmission will churn the fluid and air into a foamy liquid. Both conditions (level too low or too high) will cause the hydraulic pressure to drop, which will result in late shifting and slipping of the clutches and brakes.

In either case, air bubbles can interfere with normal valve, clutch, and brake operation. Also, foaming can cause transmission fluid to escape from the transmission vents where it may be mistaken for a leak.

6. Securely insert the dipstick.

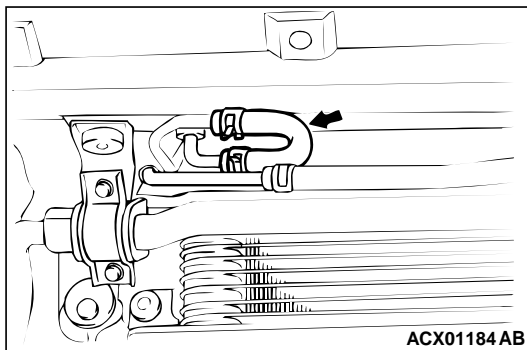
NOTE: The transmission fluid should always be replaced under the following conditions:

- When troubleshooting the transmission
- When overhauling the transmission
- When the transmission fluid is noticeably dirty or burnt (driving under severe conditions)

TRANSMISSION FLUID REPLACEMENT

M1231101700153

If you have an transmission fluid changer, use it to replace the transmission fluid. If you do not have an transmission fluid changer, replace the transmission fluid by the following procedure.



1. Disconnect the hose shown in the illustration which connects the transmission and the oil cooler (inside the radiator). Place a container under the hose to collect the discharge.

⚠ CAUTION

The engine should be stopped within one minute after it is started. If all the transmission fluid has drained out before then, the engine should be stopped at that point.

2. Start the engine and let the transmission fluid drain out. (Running conditions: "N" range with engine idling.)

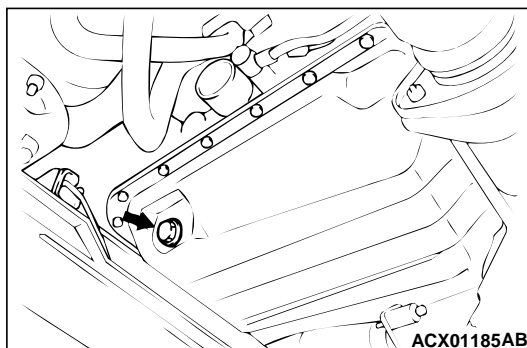
Discharge volume: Approximately 4.0 dm³ (4.2 quarts)

3. Remove the drain plug from the bottom of the transmission case to drain the transmission fluid.

Discharge volume: Approximately 2.0 dm³ (2.1 quarts)

4. Install the drain plug with a new gasket, and tighten it to the specified torque.

Tightening torque: 39 ± 5 N·m (29 ± 3 ft·lb)



⚠ CAUTION

Stop pouring if the full volume of transmission fluid can not be added.

5. Add new transmission fluid (DIAMOND ATF SP III or equivalent) through the oil filter tube.

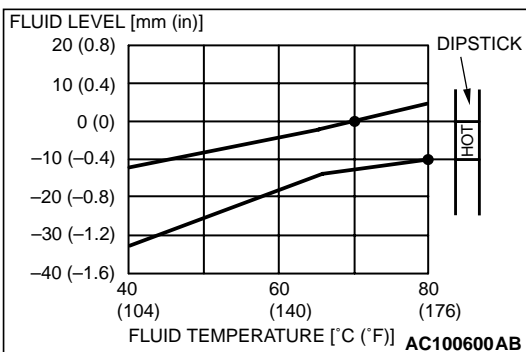
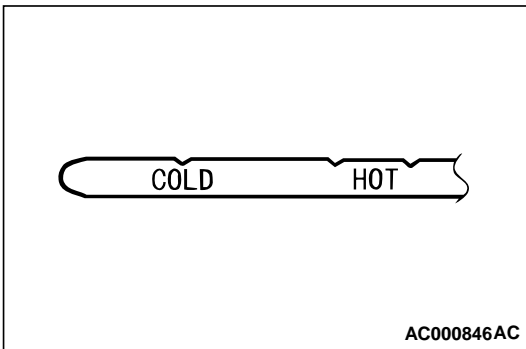
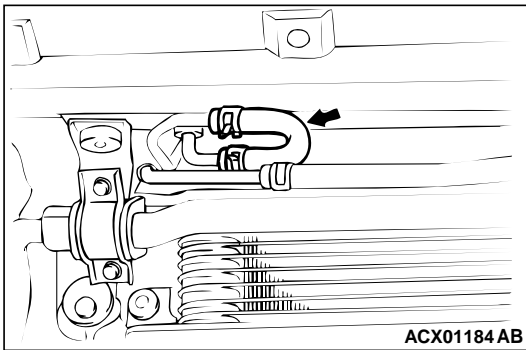
Adding volume: Approximately 6.0 dm³ (6.3 quarts)

6. Repeat the procedure in Step 2. (to pump out the rest of the contaminated transmission fluid)
7. Add new transmission fluid (DIAMOND ATF SP III or equivalent) through the oil filler tube.

Adding volume: Approximately 4.0 dm³ (4.2 quarts)

NOTE: Check for contamination or a burnt odor. If the transmission fluid is still contaminated or burnt, repeat Steps 6 and 7 before proceeding to Step 8.

8. Reconnect the hose which was disconnected in step 1 above, and firmly replace the dipstick.
9. Start the engine and run it at idle for one to two minutes.
10. Move the selector lever through all positions, and then move it to the "N" position.



11. Check that the transmission fluid level is at the "COLD" mark on the dipstick. If the level is less than this, add transmission fluid.
12. Drive the vehicle until the transmission fluid temperature rises to the normal operating temperature [70 – 80°C (158 – 176°F)], and then check the transmission fluid level again. The transmission fluid level must be at the "HOT" mark.

NOTE: The transmission fluid temperature is measured with scan tool MB991502 (MUT-II).

NOTE: The "COLD" level is for reference only; the "HOT" level should be regarded as the standard level.

NOTE: If it takes some amount of time until the transmission fluid reaches its normal operating temperature [70 – 80 °C (158 – 176 °F)], check the transmission fluid level by referring to the left diagram.

13. When the transmission fluid is less than the specified level, add transmission fluid.

When the transmission fluid is greater than the specified level, drain the excess fluid through the drain plug to adjust the transmission fluid to the specified level.

14. Firmly insert the dipstick into the oil filler tube.

FLUSHING COOLERS AND TUBES

M1231104800159

Required Special Tool:

- MB995062: Flushing Tool

⚠ WARNING

- ***Wear protective eyewear that meets the requirements of and ANSI Z87.1 – 1968 and OSHA. Wear standard industrial rubber gloves.***
- ***Keep lighted cigarettes, sparks, flames, and other ignition sources away from the area to prevent the ignition of combustible liquids and gases. Keep a class B fire extinguisher in the area where the flushing tool will be used. Keep the area well ventilated. Do not let flushing solvent come in contact with eyes or skin. If it does, flush with water for 15 to 20 seconds. Remove contaminated clothing and wash affected skin with soap and water. Seek medical attention.***

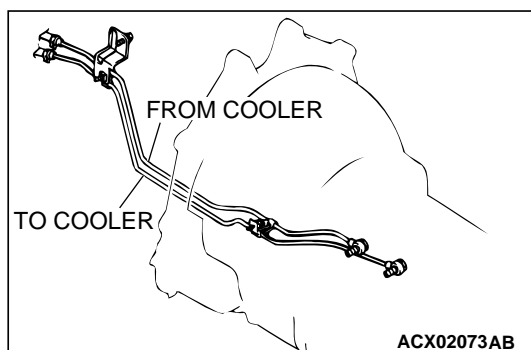
When a transmission failure has contaminated the transmission fluid, the oil cooler(s) must be flushed. The cooler by-pass valve in the transmission must also be replaced. The torque converter must also be replaced with an exchange unit. This will ensure that metal particles or sludged transmission fluid are not later transferred back into the reconditioned (or replaced) transmission. There are two different procedures for flushing coolers and lines. The recommended procedure is to use special tool MB995062 Flushing Tool. The other procedure is to use a hand suction gun and mineral spirits.

1. Remove the cover plate filler plug on special tool MB995062. Fill the reservoir 1/2 to 3/4 full with fresh flushing solution. Flushing solvents are petroleum based solutions generally used to clean transmission components. Do not use solvents containing acids, water, gasoline, or any other corrosive liquids.
2. Reinstall the filler plug on special tool MB995062.
3. Verify that the pump power switch is turned "OFF." Connect the red alligator clip to the positive battery terminal. Connect the black alligator clip to a good ground.

4. Disconnect the cooler lines at the transmission.

NOTE: When flushing the transmission cooler and lines, always reverse flush.

5. Connect the BLUE pressure line to the OUTLET line (from cooler.) cooler line.
6. Connect the CLEAR return line to the INLET line (to cooler.) cooler line.
7. Turn the pump "ON" for two to three minutes to flush the cooler(s) and lines. Monitor the pressure readings. Clear the return lines. Pressure readings should stabilize below 138 kPa (20 psi) for vehicles equipped with a single cooler and 208 kPa (30 psi) for vehicles equipped with dual coolers. If flow is intermittent or exceeds these pressures, replace the cooler(s).



8. Turn the pump "OFF."
9. Disconnect the CLEAR suction line from the reservoir at the cover plate. Disconnect the CLEAR return line at the cover plate, and place it in a drain pan.
10. Turn the pump "ON" for 30 seconds to purge flushing solution from the cooler(s) and lines. Turn the pump "OFF."
11. Place the CLEAR suction line into a one quart container of DIAMOND ATF SP III or equivalent transmission fluid.
12. Turn the pump "ON" until all transmission fluid is removed from the one quart container and lines. This purges any residual cleaning solvent from the transmission cooler(s) and lines. Turn the pump "OFF."
13. Disconnect the alligator clips from the battery. Reconnect the flusher lines to the cover plate, and remove the flushing adapters from the cooler lines. Reconnect the cooler lines.

OIL COOLER FLOW CHECK

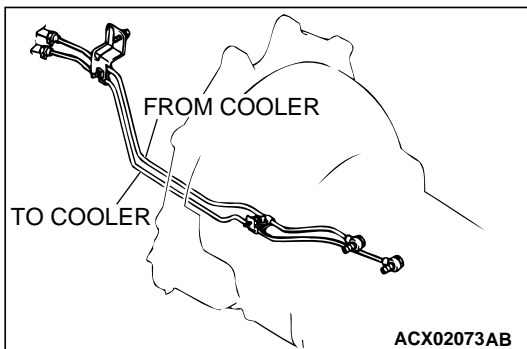
M1231104900145

After the new or repaired transmission has been installed, fill to the proper level with DIAMOND ATF SP III or equivalent transmission fluid. The flow should be checked using the following procedure:

⚠ CAUTION

With the fluid set at the proper level, transmission fluid collection should not exceed one quart or internal damage to the transmission may occur.

1. Disconnect the OUTLET line (from cooler) at the transmission and place a collecting container under the disconnected line.
2. Run the engine at curb idle speed with the shift selector in neutral.
3. If transmission fluid flow is intermittent or it takes more than 20 seconds to collect one quart of transmission fluid, replace the cooler.
4. If flow is within acceptable limits, reconnect the cooler line. Then fill the transmission to the proper level, using DIAMOND ATF SP III or equivalent transmission fluid.



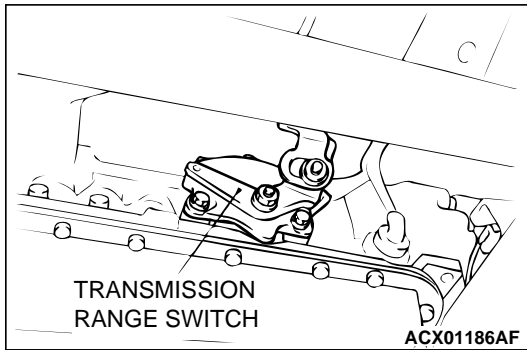
ACCELERATOR PEDAL POSITION SENSOR ADJUSTMENT

M1231102600018

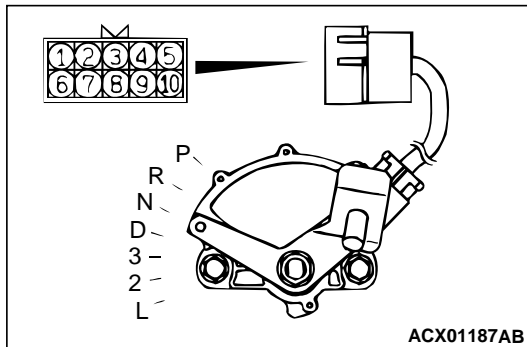
Refer to GROUP 13A – On-vehicle Service – Accelerator Pedal Position Sensor Check [P.13Aa-12](#).

TRANSMISSION RANGE SWITCH CONTINUITY CHECK

M1231101900157

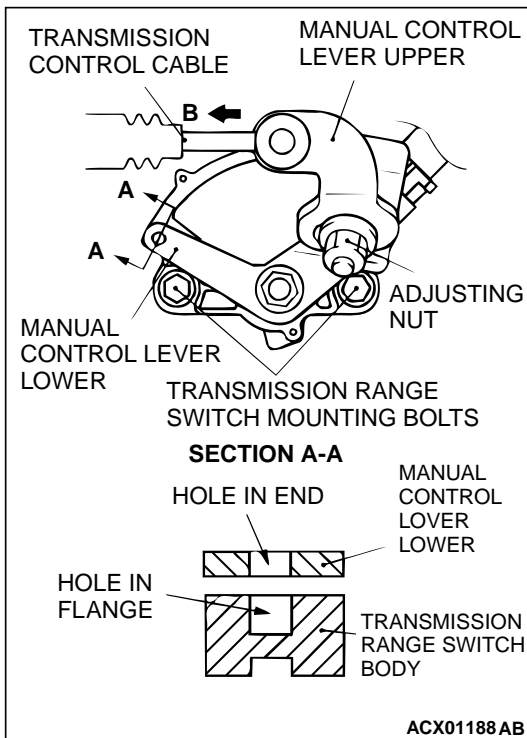


ITEM	TERMINAL CONNECTION OF TESTER	SPECIFIED CONDITION
P	1 – 7, 9 – 10	Less than 2 ohms
R	7 – 8	
N	2 – 7, 9 – 10	
D	3 – 7	



TRANSMISSION RANGE SWITCH AND CONTROL CABLE ADJUSTMENT

M1231109700124



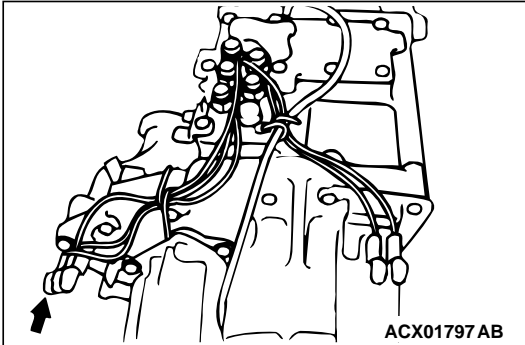
1. Set the selector lever to the "N" position.
2. Loosen the control cable to manual control lever coupling nut to free the cable and lever.
3. Set the manual control lever to the neutral position.
4. Loosen the transmission range switch body mounting bolts and turn the transmission range switch body so the hole in the end of the manual control lever and the hole (cross section A – A in the figure on the left) in the flange of the transmission range switch body are aligned.
NOTE: The transmission range switch body can be aligned by inserting a 5-mm diameter steel bar into the end hole of the manual control lever and the flange hole of the transmission range switch body.
5. Tighten the transmission range switch mounting bolts to the specified torque. Be careful at this time that the switch body does not move.
Tightening torque: 11 ± 1 N·m (98 ± 8 in-lb)
6. Gently pull the transmission control cable in the direction of the arrow (B), until the cable is taut. Tighten the adjusting nut.
Tightening torque: 23 ± 4 N·m (17 ± 3 ft-lb)
7. Check that the selector lever is in the "N" position.

8. Check that each position of the manual control lever matches each position of the selector lever using scan tool MB991502.

2WD/4WD DETECTION SWITCH CHECK

M1231111900039

Check for continuity between the terminal of the black connector located on the transfer case.

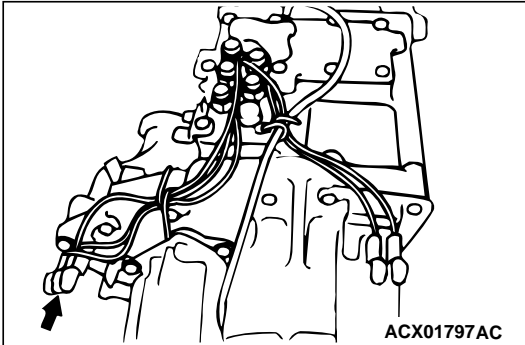


TRANSFER CONTROL LEVER POSITION	CONTINUITY
2H, 4H	Less than 2 ohms
4HLc, 4LLc	Open circuit

4H DETECTION SWITCH CHECK

M1231112000039

Check for continuity between the terminal of the white connector located on the transfer case.

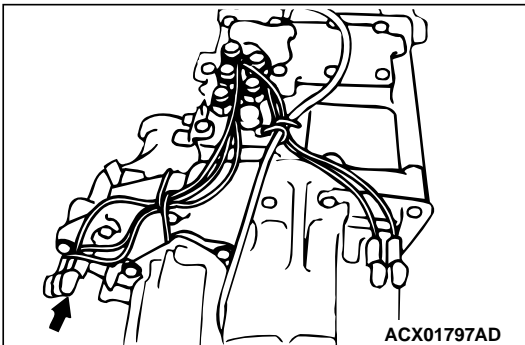


TRANSFER CONTROL LEVER POSITION	CONTINUITY
4H, 4HLc	Less than 2 ohms
2H, 4LLc	Open circuit

CENTER DIFFERENTIAL LOCK DETECTION SWITCH CHECK

M1231112100036

Check for continuity between the terminal of the brown connector located on the transfer case.

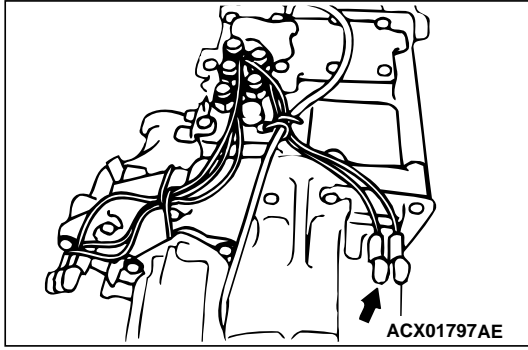


TRANSFER CONTROL LEVER POSITION	CONTINUITY
4HLc, 4LLc	Less than 2 ohms
2H, 4H	Open circuit

2WD DETECTION SWITCH CHECK

M1231112200033

Check for continuity between the terminal of the black connector located on the transfer case.

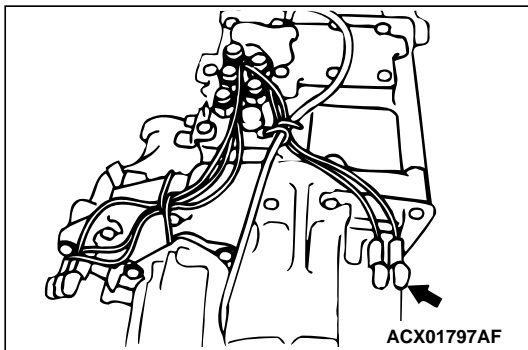


TRANSFER CONTROL LEVER POSITION	CONTINUITY
2H	Less than 2 ohms
Other than 2H	Open circuit

4LLc DETECTION SWITCH CHECK

M1231112300030

Check for continuity between the terminal of the brown connector located on the transfer case.



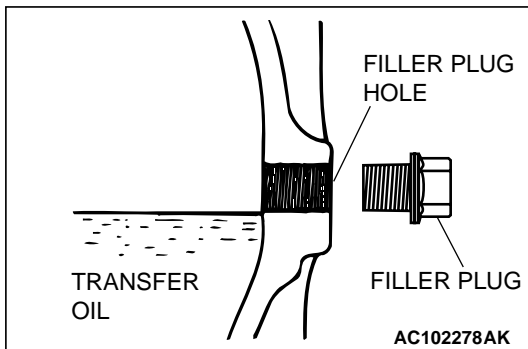
TRANSFER CONTROL LEVER POSITION	CONTINUITY
4LLc	Less than 2 ohms
Other than 4LLc	Open circuit

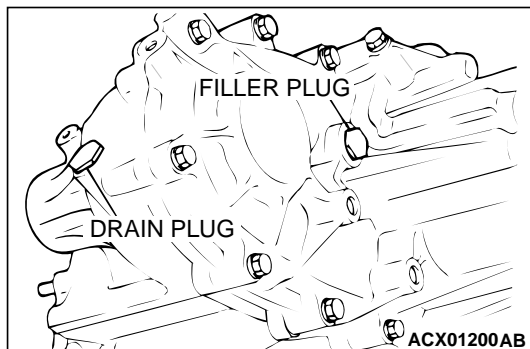
TRANSFER OIL CHECK

M1231112400101

1. Remove the filler plug.
2. Check that the oil level is up to the lower edge of the filler plug hole.
3. Check that the oil is not noticeably dirty.
4. Tighten the filler plug to the specified torque.

Tightening torque: 32 ± 2 N·m (24 ± 1 ft·lb)





TRANSFER OIL REPLACEMENT

M1231112500108

1. Remove the filler plug.
2. Remove the drain plug and discharge the oil.
3. Tighten the drain plug to the specified torque.

Tightening torque: 32 ± 2 N·m (24 ± 1 ft-lb)

4. Fill in oil to the bottom of the filler plug hole.

**Specified oil: Gear oil SAE 75W – 90 or 75W – 85W
conforming to API classification GL-4**

Quantity: 2.8 dm³ (3.0 quarts)

5. Tighten the filler plug to the specified torque.

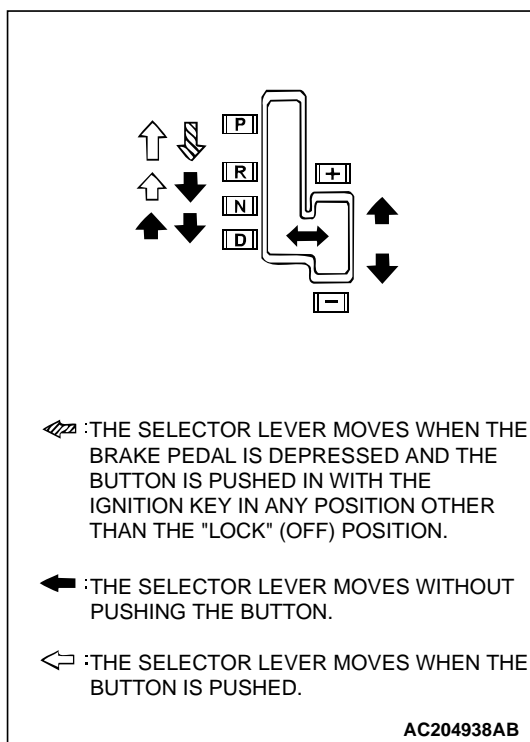
Tightening torque: 32 ± 2 N·m (24 ± 1 ft-lb)

SELECTOR LEVER OPERATION CHECK

M1231001300288

1. Apply the parking brake, and check that the selector lever moves smoothly and accurately to each position.
2. Check that the engine starts when the selector lever is in the "N" or "P" position, and that it does not start when the selector lever is in any other position.
3. Start the engine, release the parking brake, and check that the vehicle moves forward when the selector lever is moved from the "N" position to 1st or 2nd gear in sport mode, and that the vehicle reverses when the selector lever is moved to the "R" position.
4. Stop the engine.
5. Turn the ignition switch to the "ON" position, and check that the backup lamp illuminates when the selector lever is shifted from the "P" to the "R" position.

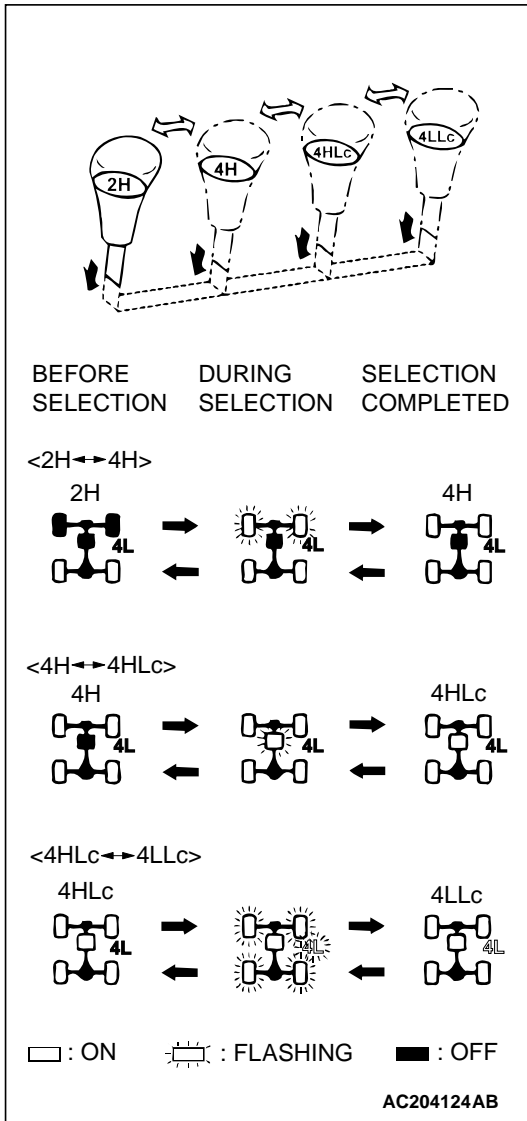
NOTE: The A/T key interlock and shift lock mechanisms prevent movement of the selector lever from the "P" position if the ignition switch is in a position other than "LOCK" (OFF) and the brake pedal is not depressed.



TRANSFER SHIFT LEVER OPERATION CHECK

M1231120800029

1. Check that the transfer shift lever moves smoothly and correctly to each transfer gear position when the lever is pushed downwards and moved.
2. Apply the parking brake, turn the ignition switch to the "ON" position and move the selector lever to "N" position.



3. Check that the 4WD indicator light illuminates, flashes or switches off according to the pattern shown in the illustration when the transfer shift lever is move to each transfer position.
4. If the selection is not completed even after 5 seconds or more have passed, carry out the following procedure.
 - (1) Return the transfer shift lever to the position it was at before selection.
 - (2) Start the engine, drive the vehicle straight forward, and then stop the engine.
 - (3) Apply the parking brake, and then move the selector lever to the "N" position.
 - (4) Operate the transfer shift lever once more.

NOTE: If the vehicle is not fully stopped or if the selector lever is at a position other than "N" position when selecting 4HLc or 4LLc, the 4WD indicator light will flash more quickly than normal, and the 4WD position will not be selected. This is a normal phenomenon which serves to control the smooth selection of 4HLc and 4LLc.

KEY INTERLOCK AND SHIFT LOCK MECHANISM CHECK

M1232003100078

1. Carry out the following inspection.

KEY INTERLOCK SIDE			
INSPECTION PROCEDURE	INSPECTION REQUIREMENTS	INSPECTION ITEM (NORMAL CONDITION)	
1	Brake pedal: Depressed	Ignition key position: "LOCK" (OFF) or removed	Unable to push in the selector lever push button and move the lever out of the "P" position.
2		Ignition key position: "ACC"	Able to push in the selector lever push button, move the lever out of the "P" position, and shift to any position.
3	Brake pedal: Not depressed	Selector lever: Other than "P" position	Unable to turn the ignition key to the "LOCK" (OFF) position.
4		Selector lever: "P" position	Able to turn the ignition key to the "LOCK" (OFF) position.

SHIFT LOCK SIDE		
INSPECTION PROCEDURE	INSPECTION CONTENTS	CHECK DETAILS (NORMAL CONDITION)
1	Brake pedal: Not depressed	Ignition key position: "ACC" When the selector lever push button is depressed, the selector lever can not be shifted out of the "P" position.
2	Brake pedal: Depressed	
3	Brake pedal: Not depressed	
		When the selector lever push button is depressed, the selector lever can be shifted smoothly to other position.
		When the selector lever push button is depressed, the selector lever can be shifted smoothly from the "R" position to the "P" position.

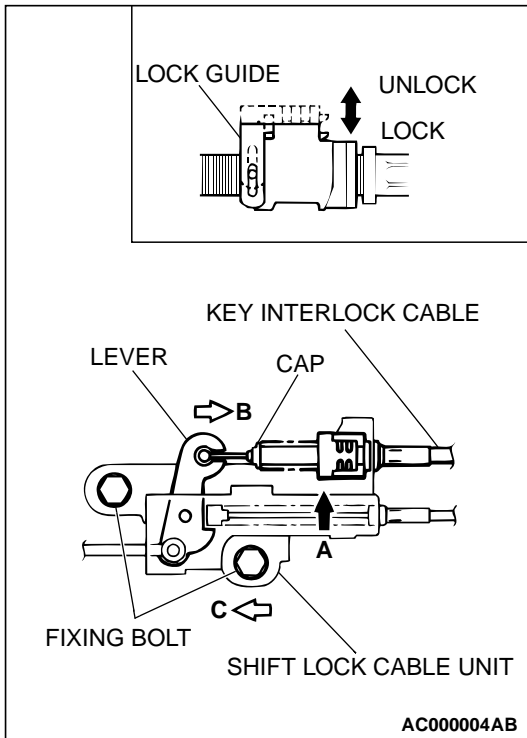
2. When any of the above checks are not normal, adjust the shift lock cable unit in following procedure.
 - (1) Remove the front floor console. (Refer to GROUP 52A – Floor Console Assembly P.52A-7.)
 - (2) Shift selector lever to "P" position.
 - (3) Turn the ignition key to "LOCK" (OFF) position.
 - (4) Loosen the bolt fixing the shift lock cable unit, push the lever in direction B and the unit in direction C and tighten the bolt at the standard torque.

Tightening torque: 5.0 ± 1.0 N·m (44 ± 9 in-lb)

- (5) Lift the lock guide of the key interlocking cable and then unlock it.
- (6) Lower the lock guide of the key interlocking cable and then lock it.

NOTE: The key interlocking cable is adjusted according to the lock position (cap push state) at this time. Readjust the lock position if key interlocking operations malfunction after locking.

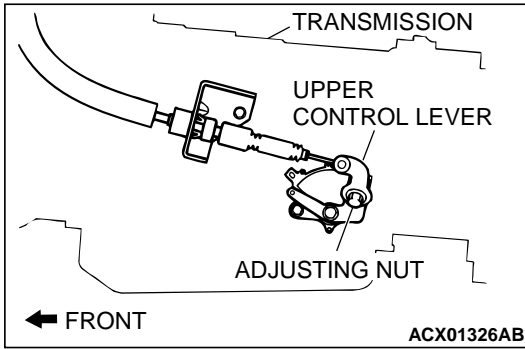
3. After adjustment, re-check the operations. Replace the shift lock cable unit if operations are defective. (Refer to P.23Aa-35.)



TRANSMISSION CONTROL CABLE ADJUSTMENT

M1231119500024

1. Move the selector lever to the "N" position.



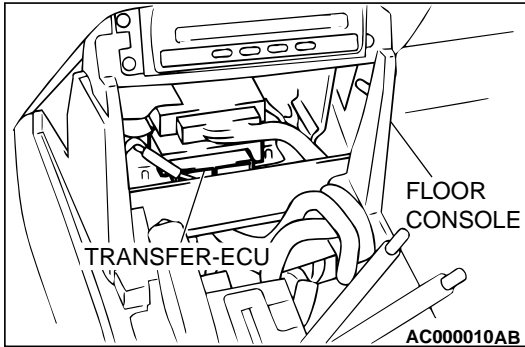
2. Loosen the upper control lever adjusting nut.
3. Check that the transmission range switch is at "N" position.
4. Adjust the upper control lever so that there is no slackness or excessive tightness in the transmission control cable, and then tighten the adjusting nut to the specified torque.

Tightening torque: 23 ± 4 N·m (17 ± 3 ft·lb)

5. Check that the transmission operation and functioning in each position corresponds accurately to the position of the selector lever.

TRANSFER-ECU CHECK

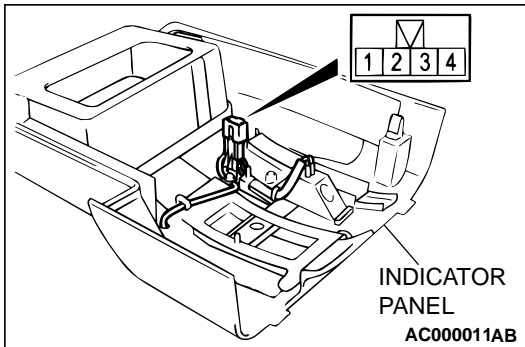
M1231120900037



1. Remove the indicator panel and the floor console front panel. (Refer to GROUP 52A – Floor Console P.52A-7.)
2. Measure the transfer-ECU terminal voltage. (Refer to P.23Ab-53.)

POSITION INDICATOR LIGHT CHECK

M1231121000026



1. Remove the indicator panel. (Refer to GROUP 52A – Floor Console P.52A-7.)
2. Check that there is continuity between the following terminals:

TERMINAL NO.	NORMAL CONDITION
1 – 2	Less than 2 ohms
3 – 4	

3. If the continuity is incorrect, replace the position indicator light unit assembly.

**AUTOMATIC TRANSMISSION CONTROL
COMPONENT CHECK**

CRANKSHAFT POSITION SENSOR CHECK

M1231102700123

Refer to GROUP 13A, Diagnosis – Check Procedure With Oscilloscope. P.13Ab-50.

**ACCELERATOR PEDAL POSITION SENSOR
CHECK**

M1231102800012

Refer to GROUP 13A, On-vehicle Service – Accelerator Pedal Position Sensor Check. P.13Ab-50.

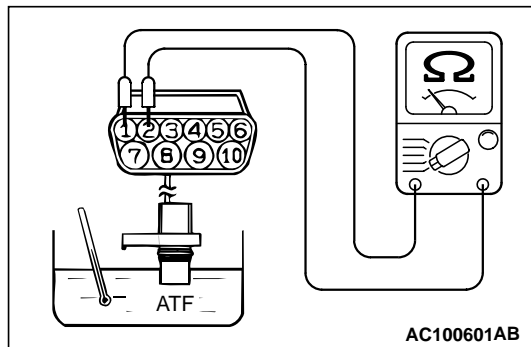
TRANSMISSION FLUID TEMPERATURE SENSOR CHECK

M1231104500158

1. Remove the transmission fluid temperature sensor.
2. Measure the resistance between terminals No.1 and No.2 of the transmission fluid temperature sensor connector.

Standard value:

TRANSMISSION FLUID TEMPERATURE	RESISTANCE
0°C (32°F)	16.7 – 20.5 kΩ
20°C (68°F)	7.3 – 8.9 kΩ
40°C (104°F)	3.4 – 4.2 kΩ
60°C (140°F)	1.9 – 2.2 kΩ
80°C (176°F)	1.0 – 1.2 kΩ
100°C (212°F)	0.57 – 0.69 kΩ



3. If the transmission fluid temperature sensor resistance is outside the specified range and the "A/T TEMP" indicator light is illuminating, replace the transmission fluid temperature sensor.

NOTE: The "A/T TEMP" indicator light on the combination meter illuminating when the temperature reaches approximately 125°C (257°F) or greater, and then stops flashing when the temperature drops below approximately 115°C (238°F).

TRANSMISSION RANGE SWITCH CHECK

M1231112600105

Refer to [P.23Aa-20](#).

STOPLIGHT SWITCH CHECK

M1231103000127

Refer to GROUP 35A, On-vehicle Service – Stoplight Switch Check [P.35A-116](#).

VEHICLE SPEED SENSOR CHECK

M1231109800110

Refer to GROUP 54A, Combination Meters Assembly and Vehicle Speed Sensor [P.54A-66](#).

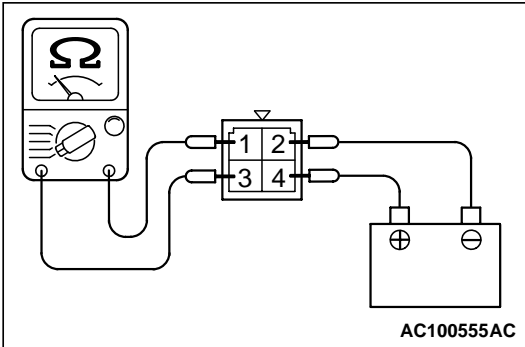
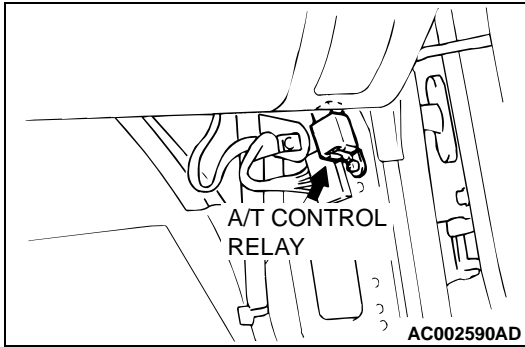
DUAL PRESSURE SWITCH CHECK

M1231109900117

Refer to GROUP 55A, On-vehicle Service – Dual Pressure Switch Check [P.55A-118](#).

A/T CONTROL RELAY CHECK

M1231110300119



1. Remove the A/T control relay.

2. Use jumper wires to connect A/T control relay terminal 2 to the negative battery terminal and terminal 4 to the positive battery terminal.

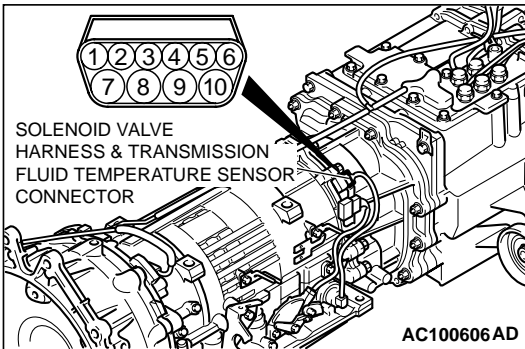
3. Check for continuity between A/T control relay terminals 1 and 3 when the jumper wires are connected to and disconnected from the battery.

JUMPER WIRE	CONTINUITY BETWEEN TERMINALS NO.1 AND NO.3
Connected	Less than 2 ohms
Disconnected	Open circuit

4. If there is any problem with the A/T control relay, replace it.

SOLENOID VALVE CHECK

M1231110400116



1. Use scan tool MB991502 to measure the transmission fluid temperature. The desired temperature setting for performing the solenoid valve check is 20°C (68°F).

2. Remove the solenoid valve harness and transmission fluid temperature sensor connector.

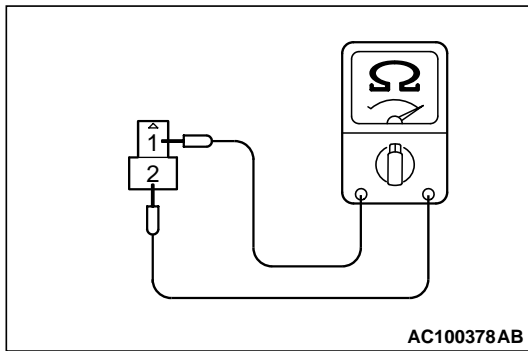
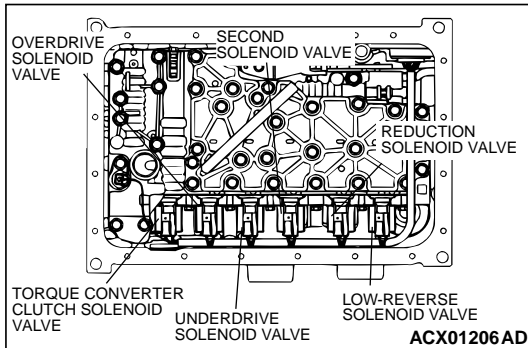
3. Measure the resistance between the solenoid valve terminals.

4. The measured resistance of the solenoid valve when the transmission fluid temperature is 20°C (68°F) should match the specified resistance on the chart below.

Standard value:

TERMINAL NO.	ITEMS	RESISTANCE
7 - 10	Torque converter clutch solenoid valve	2.7 – 3.4 Ω [at 20°C (68°F)]
6 - 10	Low-reverse/Direct solenoid valve	
4 - 9	Second solenoid valve	
3 - 9	Underdrive solenoid valve	
5 - 9	Overdrive solenoid valve	
8 - 10	Reduction solenoid valve	

5. If the solenoid valve resistance is within the specified range, check the power supply and the ground circuits.
6. If the solenoid valve resistance is not within the specified range, drain the transmission fluid and remove the valve body cover.
7. Disconnect the connector of any solenoid valves that are not within the specified range.



8. Measure the resistance between terminals 1 and 2 of any solenoid valve that was not within the specified range.

Specified resistance:
2.7 – 3.4 Ω [at 20°C (68°F)]
9. If the resistance is not within the specified range, replace the solenoid valve.
10. If the resistance is within the specified range, check the wiring harness between the affected A/T control solenoid valve assembly and the solenoid valve. If a problem is not found in the above steps, check the solenoid valve O-rings and replace them if necessary.

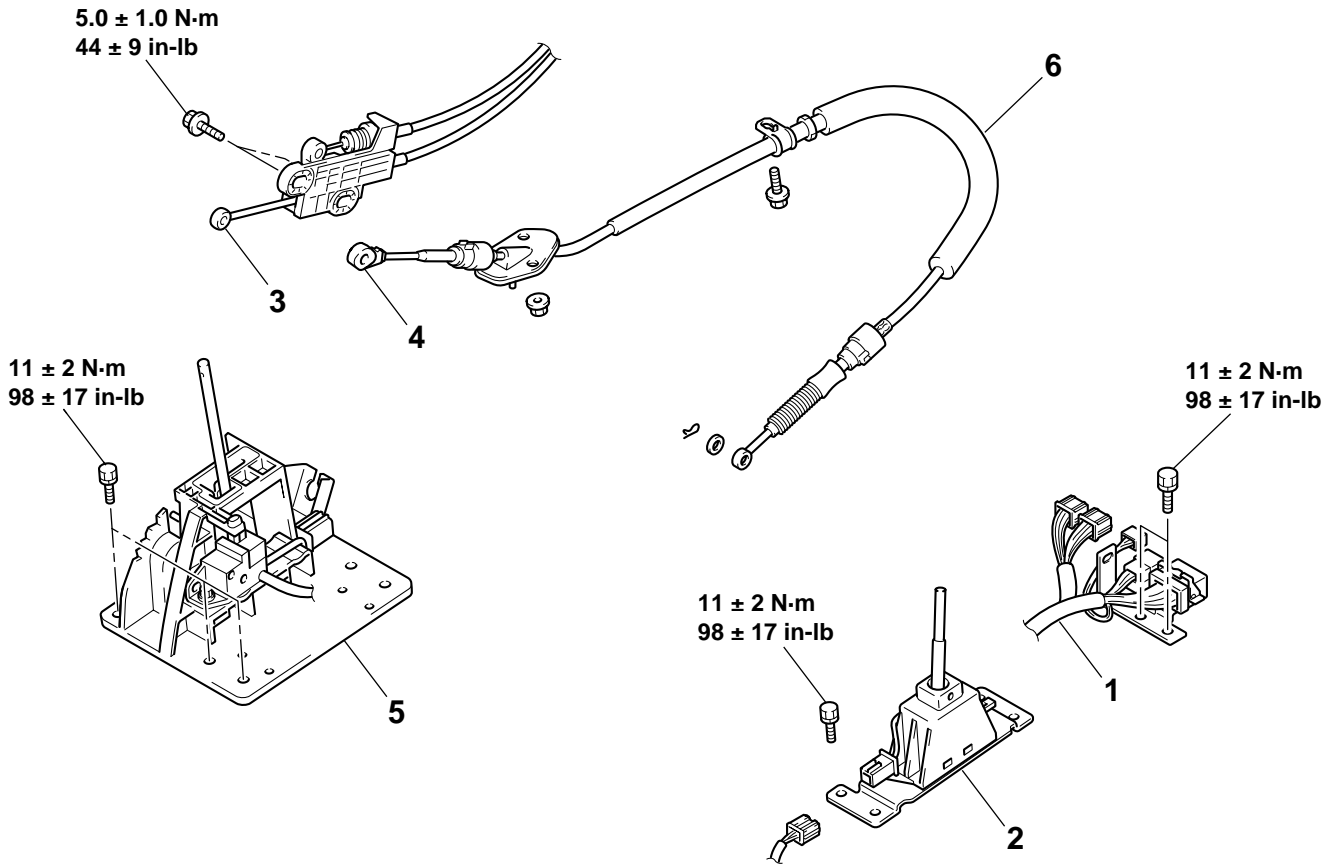
TRANSMISSION CONTROL

REMOVAL AND INSTALLATION

M1231117900101

CAUTION

When removing and installing the transmission control cable and shift lock cable unit, be careful not to hit the SRS-ECU.



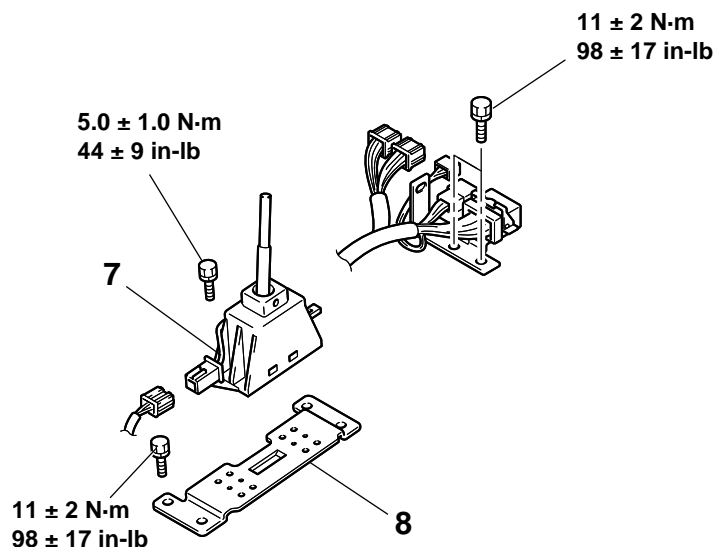
AC000012AD

SELECTOR LEVER ASSEMBLY AND TRANSMISSION CONTROL CABLE ASSEMBLY REMOVAL STEPS

- FRONT FLOOR CONSOLE (REFER TO GROUP 52A P.52A-7.)
- 1. TRANSMISSION CONTROL HARNESS CONNECTION
- 2. TRANSFER SHIFT LEVER SWITCH, BRACKET ASSEMBLY
- >>C<< 3. SHIFT LOCK CABLE UNIT CONNECTION

SELECTOR LEVER ASSEMBLY AND TRANSMISSION CONTROL CABLE ASSEMBLY REMOVAL STEPS (Continued)

- 4. TRANSMISSION CONTROL CABLE CONNECTION
- 5. SELECTOR LEVER ASSEMBLY FRONT EXHAUST PIPE (REFER TO GROUP 15 P.15-13.)
- <<A>> >>B<< 6. TRANSMISSION CONTROL CABLE ASSEMBLY



AC204313AB

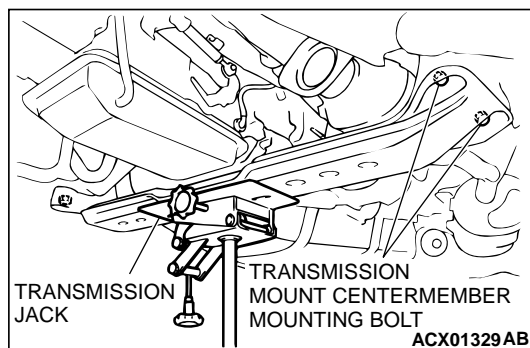
- **TRANSFER SHIFT LEVER SWITCH REMOVAL STEPS**
INDICATOR PANEL (REFER TO GROUP 52A – FLOOR CONSOLE P.52A-7.)

- 7. **TRANSFER SHIFT LEVER SWITCH**
- 8. **BRACKET**

REMOVAL SERVICE POINT

<<A>> TRANSMISSION CONTROL CABLE ASSEMBLY REMOVAL

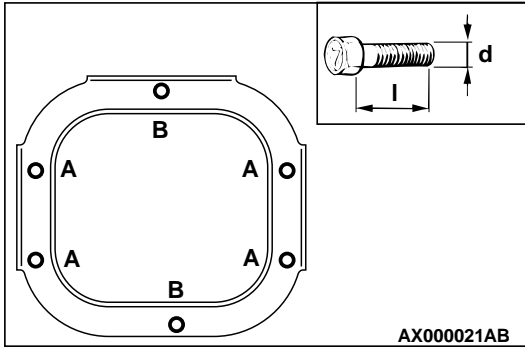
1. Support the transmission mount center member with a transmission jack, and then remove the transmission mount center member mounting bolts.
2. Lower the transmission so that there is enough room available to remove the transmission control cable assembly mounting nuts, and then remove the transmission control cable assembly mounting nuts.



INSTALLATION SERVICE POINTS

>>A<< RETAINER INSTALLATION

The bolt lengths differ according to where they are to be installed, so do not install them in the wrong place.



BOLTS	d × l mm
A	6 × 14
B	6 × 16

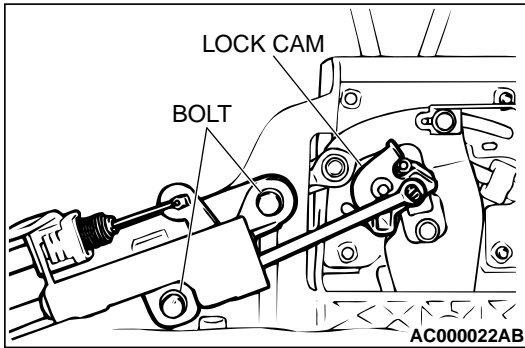
>>B<< TRANSMISSION CONTROL CABLE ASSEMBLY INSTALLATION

After installing the transmission control cable assembly, install the transmission mount center member mounting bolts and tighten them to the specified torque.

Tightening torque: 44 ± 10 N·m (33 ± 7 ft-lb)

>>C<< SHIFT LOCK CABLE UNIT INSTALLATION

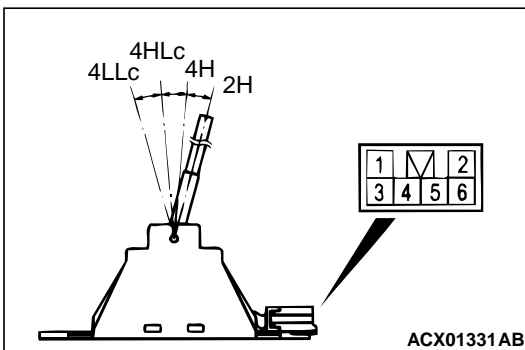
1. Temporarily install the selector lever knob, and then move the selector lever to the "P" position and turn the ignition switch to the "LOCK" (OFF) position.
2. After installing the rod of the shift lock cable unit to the lock cam of the selector lever assembly, install the bolts of the shift lock cable unit.
3. Check the operation of the selector lever assembly. (Refer to P.23Aa-23.)



INSPECTION

M1231118000101

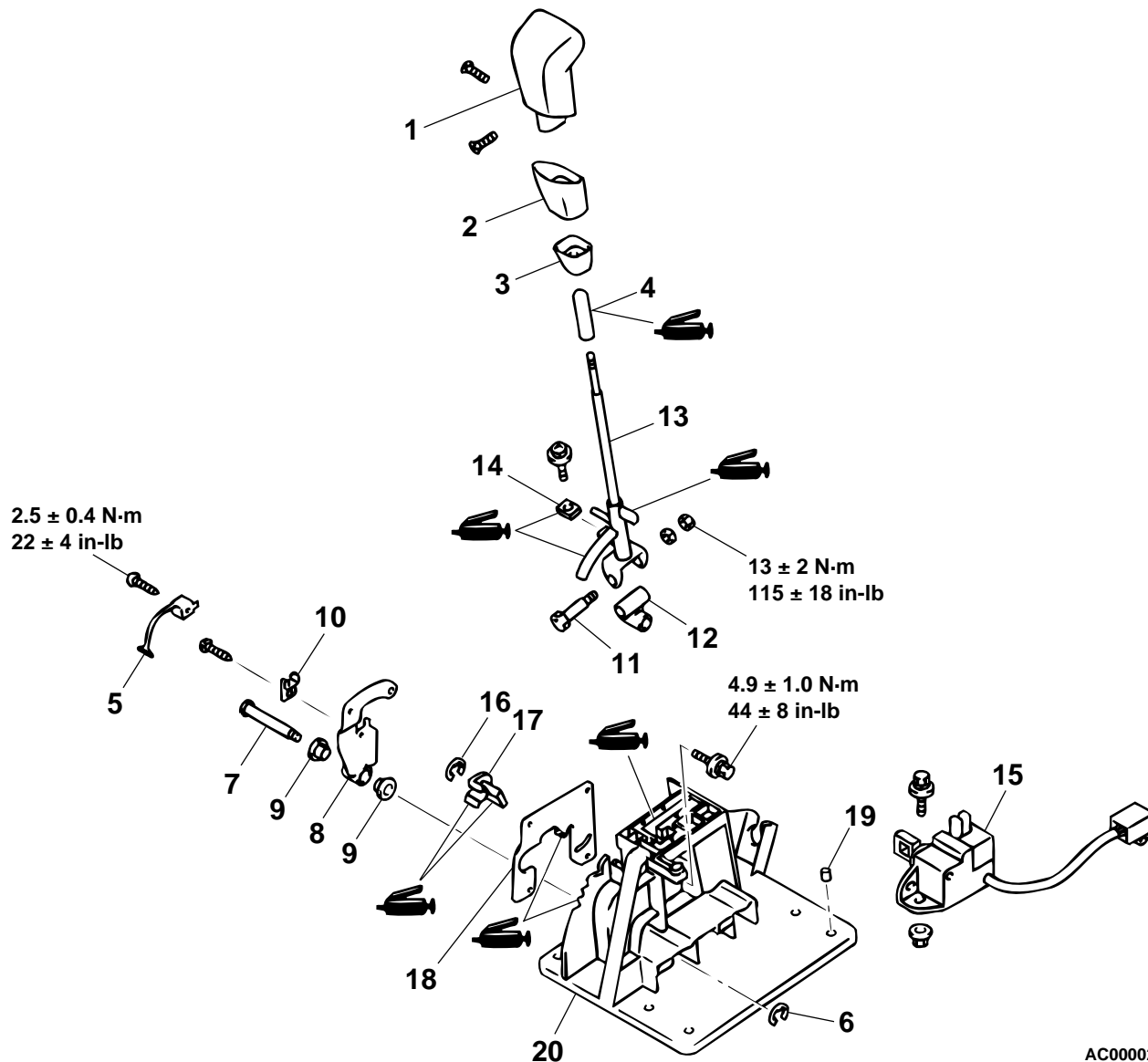
TRANSFER SHIFT LEVER SWITCH CONTINUITY CHECK



SWITCH POSITION	MEASUREMENT TERMINAL
2H	1 - 3
4H	1 - 4
4HLC	1 - 5
4LLC	1 - 2

DISASSEMBLY AND ASSEMBLY

M1231006800266



AC000024 AC

<<A>>

DISASSEMBLY STEPS

1. SHIFT KNOB
2. KNOB COVER A
3. KNOB COVER B
4. SLEEVE
- FRONT FLOOR CONSOLE
(REFER TO GROUP 52A P.52A-7.)
5. DETENT SPRING
6. SNAP RING
7. SHAFT
8. ARM ASSEMBLY
9. BUSHING

DISASSEMBLY STEPS

10. ARM COVER
11. BOLT
12. UNIVERSAL JOINT
13. LEVER ASSEMBLY
14. STAY COVER
15. SHIFT SWITCH ASSEMBLY
16. SNAP RING
17. LOCK CAM
18. DETENT PLATE ASSEMBLY
19. COLLAR
20. BASE BRACKET

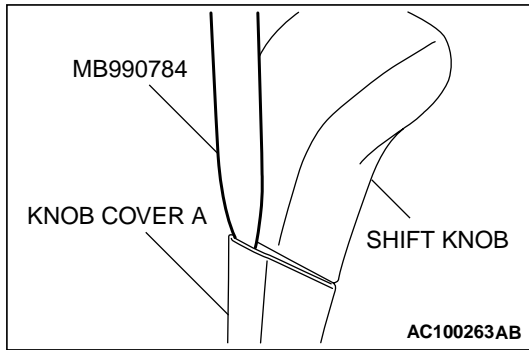
Required Special Tool:

- MB990784: Ornament Remover

REMOVAL SERVICE POINT

<<A>> SHIFT KNOB REMOVAL

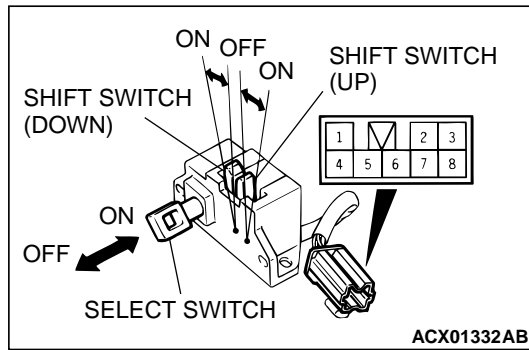
Insert special tool MB990784 in the crack of knob cover A and shift knob, and then push down on knob cover A and remove screw.



INSPECTION

M1231118200020

SHIFT SWITCH ASSEMBLY CONTINUITY CHECK



SWITCH POSITION		TERMINAL NO.
Select switch	ON	1 – 4
	OFF	1 – 5
Shift switch (up shift)	ON	3 – 7
	OFF	–
Shift switch (down shift)	ON	3 – 8
	OFF	–

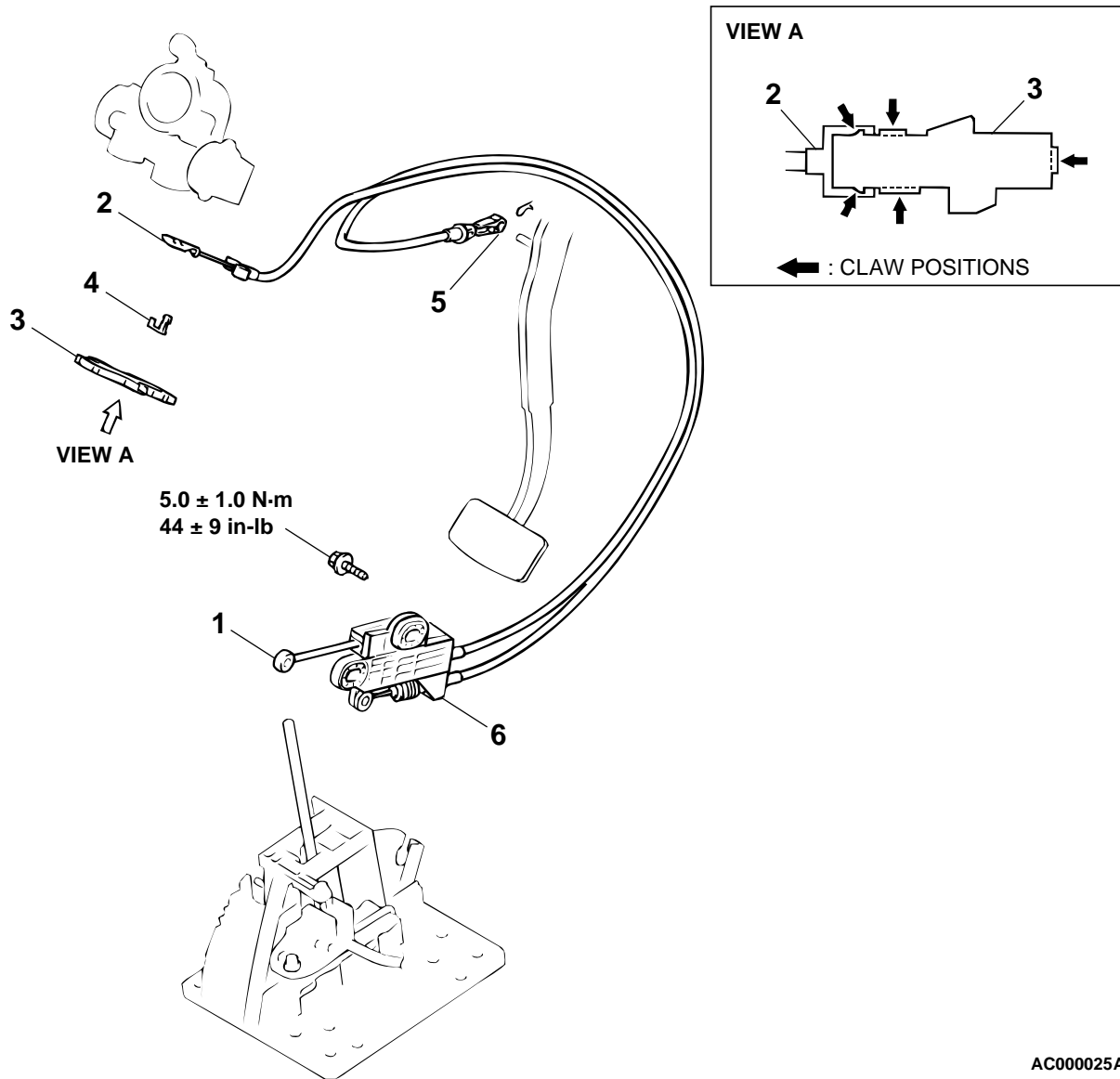
A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS

REMOVAL AND INSTALLATION

M1232001200295

⚠ CAUTION

When removing and installing the transmission control cable and shift lock cable unit, be careful not to hit the SRS-ECU.



AC000025AD

**SHIFT LOCK CABLE UNIT
REMOVAL STEPS**

- COLUMN COVER (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY P.52A-7.)
- FRONT FLOOR CONSOLE (REFER TO GROUP 52A, FLOOR CONSOLE ASSEMBLY P.52A-7.)

**SHIFT LOCK CABLE UNIT
REMOVAL STEPS (Continued)**

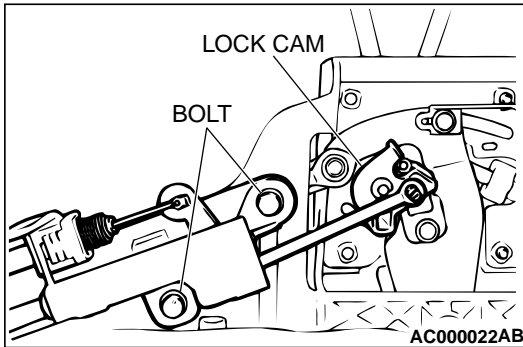
- | | | |
|-------|----|----------------------------------|
| >>A<< | 1. | SHIFT LOCK CABLE UNIT CONNECTION |
| <<A>> | 2. | KEY INTERLOCK CABLE CONNECTION |
| | 3. | COVER |
| | 4. | LOCK BAR |
| | 5. | SHIFT LOCK CABLE CONNECTION |
| | 6. | SHIFT LOCK CABLE UNIT |

REMOVAL SERVICE POINT**<<A>> KEY INTERLOCK CABLE REMOVAL**

Turn the ignition switch to the "ACC" position, and then pull the key interlock cable out from the ignition key cylinder.

INSTALLATION SERVICE POINT**>>A<< SHIFT LOCK CABLE UNIT INSTALLATION**

1. Temporarily install the selector lever knob, and then move the selector lever to the "P" position and turn the ignition switch to the "LOCK" (OFF) position.
2. After installing the rod of the shift lock cable unit to the lock cam of the selector lever assembly, install the bolts of the shift lock cable unit.
3. Check the operation of the selector lever assembly. (Refer to [P.23Aa-23.](#))



TRANSMISSION AND TRANSFER ASSEMBLY

REMOVAL AND INSTALLATION

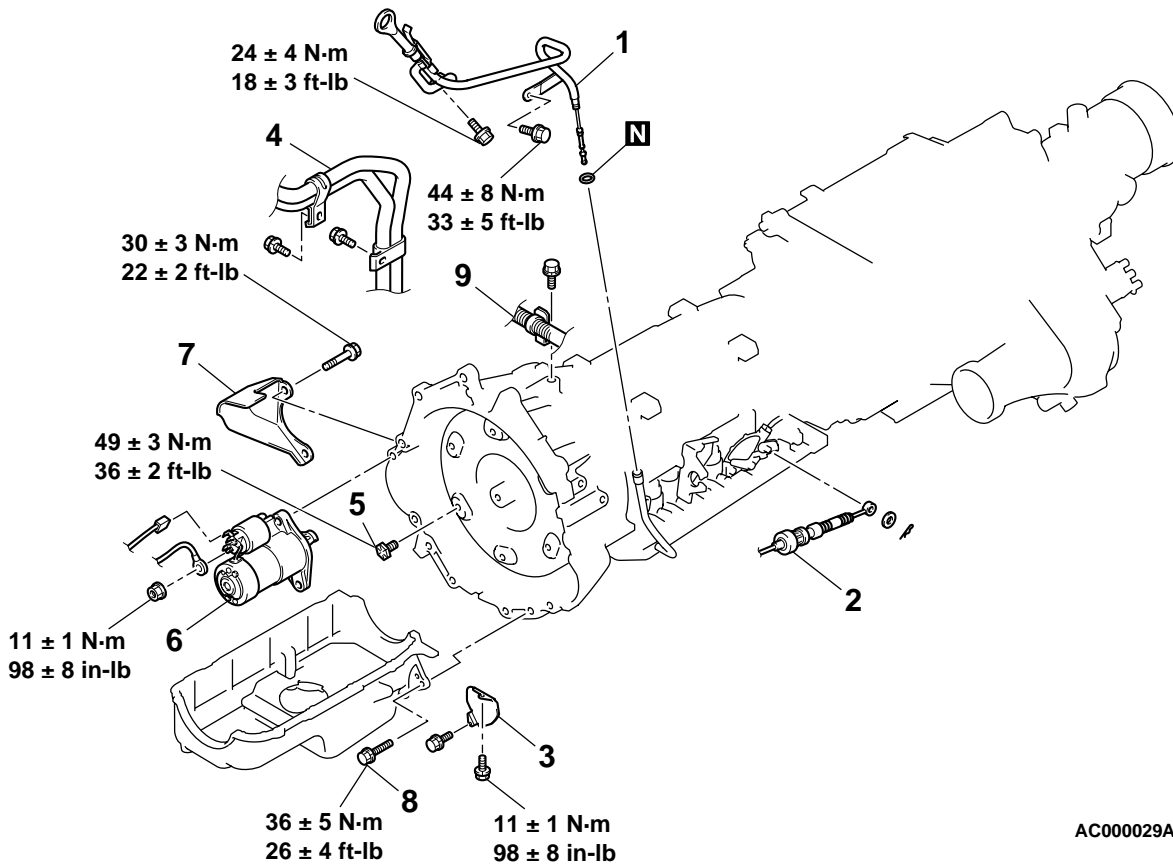
M1231117600100

⚠ CAUTION

The rear propeller shaft incorporates a carbon fiber-reinforced plastic tube, so be sure to refer to GROUP 25 during removal.

Pre-removal and Post-installation Operations

- Skid Plate and Under Cover Removal and Installation
- Transmission Fluid and Transfer Oil Draining and Refilling (Refer to P.23Aa-16 and P.23Aa-23.)
- Front and Rear Propeller Shaft Removal and Installation (Refer to GROUP 25 P.25-5.)
- Front Exhaust Pipe Removal and Installation (Refer to GROUP 15 P.15-12.)
- Radiator Shroud Lower Cover Removal and Installation (Refer to GROUP 14 P.14-8.)



AC000029AC

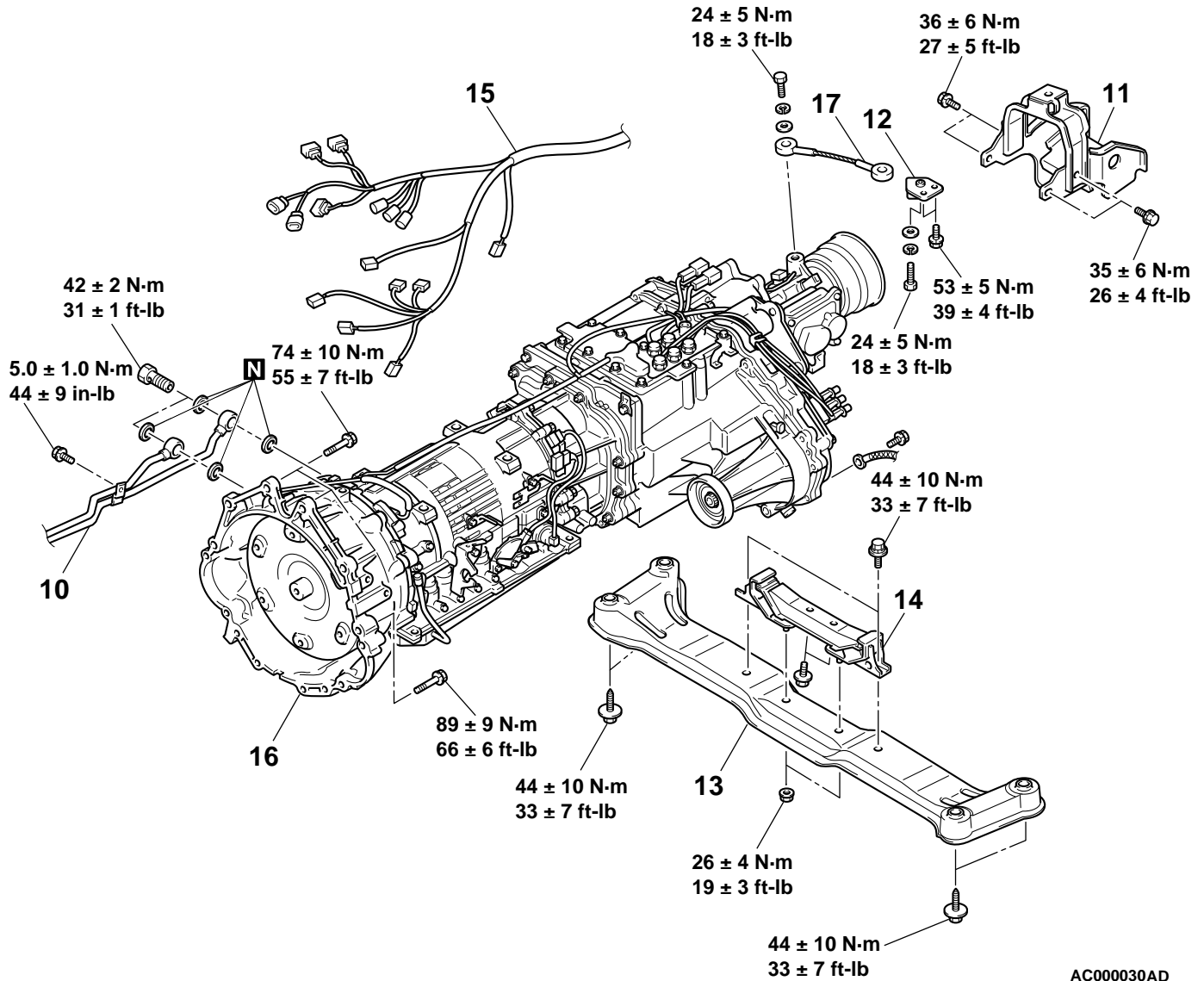
REMOVAL STEPS

1. TRANSMISSION FLUID
2. DIPSTICK GUIDE
3. COVER
4. HEATER HOSE CONNECTION

<<A>>

REMOVAL STEPS (Continued)

5. TORQUE CONVERTER AND DRIVE PLATE CONNECTION BOLTS
6. STARTER MOTOR
7. STARTER COVER
8. OIL PAN CONNECTION BOLTS
9. BATTERY CABLE CONNECTION



- REMOVAL STEPS**
10. OIL COOLER TUBE CONNECTION
 11. DYNAMIC DAMPER
 12. TENSION WIRE BRACKET
 - SUPPORT THE TRANSMISSION WITH A TRANSMISSION JACK
 13. TRANSMISSION MOUNT CENTER MEMBER ASSEMBLY

<>

>>A<<

- REMOVAL STEPS (Continued)**
14. TRANSMISSION MOUNT INSULATOR ASSEMBLY
 15. TRANSMISSION HARNESS CONNECTOR CONNECTION
 16. TRANSMISSION ASSEMBLY
 17. TENSION WIRE

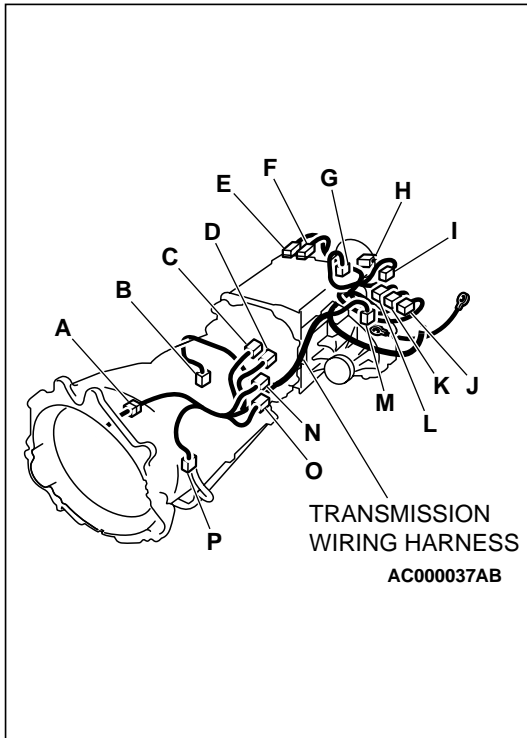
REMOVAL SERVICE POINTS

<<A>> TORQUE CONVERTER AND DRIVE PLATE CONNECTION BOLT REMOVAL

1. While turning the crankshaft, remove the six connecting bolts.
2. Push the torque converter towards the transmission, away from the engine.

**<> TRANSMISSION WIRING HARNESS CONNECTOR
DISCONNECTION**

1. Lower the transmission to a position where the transmission harness connector can be disconnected, and then disconnect the connector.



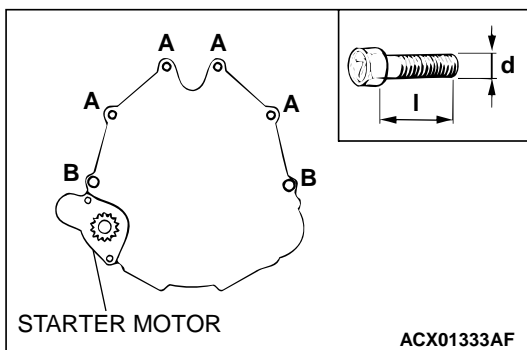
SYMBOL	CONNECTOR NAME
A	TRANSMISSION WIRING HARNESS AND BATTERY WIRING HARNESS COMBINATION
B	OUTPUT SHAFT SPEED SENSOR
C	AUTOMATIC TRANSMISSION CONTROL SOLENOID VALVE ASSEMBLY
D	TRANSMISSION RANGE SWITCH
E	4LLc DETECTION SWITCH
F	2WD DETECTION SWITCH
G	REAR PROPELLER SHAFT SPEED SENSOR
H	VEHICLE SPEED SENSOR
I	SHIFT ACTUATOR
J	2WD/4WD DETECTION SWITCH
K	4H DETECTION SWITCH
L	CENTER DIFFERENTIAL LOCK DETECTION SWITCH
M	FRONT PROPELLER SHAFT SPEED SENSOR
N	RIGHT BANK OXYGEN SENSOR (REAR)
O	LEFT BANK OXYGEN SENSOR (REAR)
P	INPUT SHAFT SPEED SENSOR

2. Position the disconnected transmission harness so that it rests on the vehicle body.

INSTALLATION SERVICE POINT

>>A<< TRANSMISSION ASSEMBLY INSTALLATION

The bolt lengths differ according to where they are to be installed, so do not install them in the wrong place.



BOLTS	d × l mm
A	12 × 40
B	12 × 55

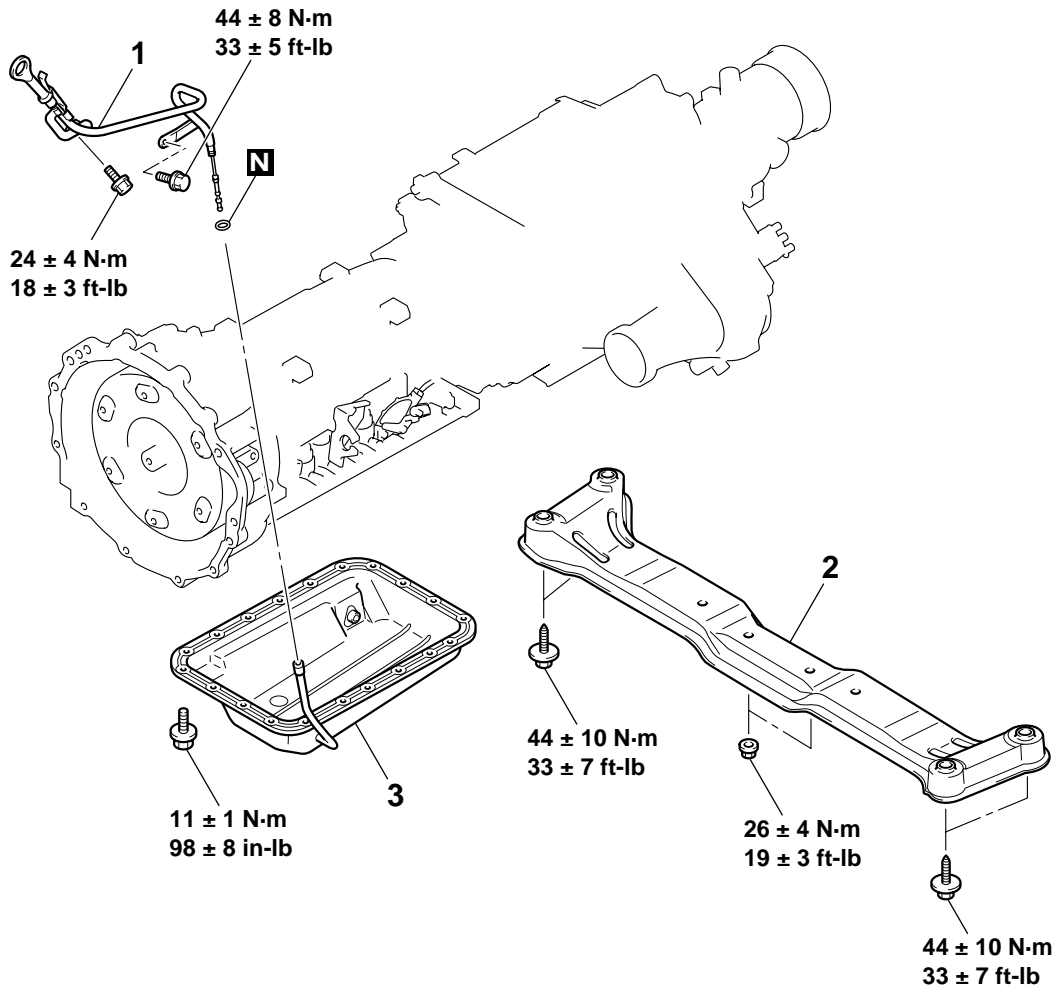
OIL PAN

REMOVAL AND INSTALLATION

M1231120700129

Pre-removal and Post-installation Operation

- Transmission Fluid Draining (Refer to GROUP 00, Maintenance Service - Automatic Transmission Fluid P.00-41.)
- Under Cover Removal and Installation.



AC100073AB

REMOVAL STEPS

1. TRANSMISSION FLUID DIPSTICK GUIDE
- SUPPORT THE TRANSMISSION WITH A TRANSMISSION JACK

REMOVAL STEPS (Continued)

2. TRANSMISSION MOUNT CENTER MEMBER ASSEMBLY
3. OIL PAN

<<A>> >>A<<

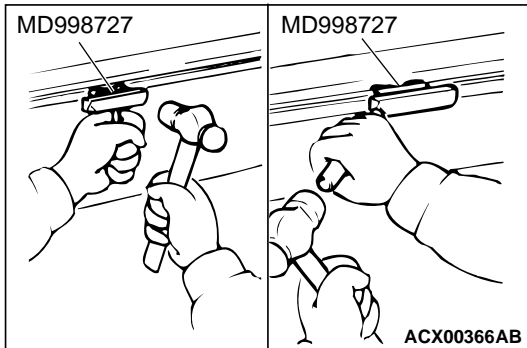
Required Special Tool:

- MD998727: Oil Pan Remover

REMOVAL SERVICE POINT

<<A>> OIL PAN REMOVAL

After removing the oil pan mounting bolts, remove the oil pan with special tool MD998727 and a brass bar.



INSTALLATION SERVICE POINT

>>A<< OIL PAN INSTALLATION

1. Remove sealant from the oil pan and transmission case mating surfaces.
2. Degrease the sealant-coated surface and the transmission mating surface.
3. Clean the magnet and install it in the hollow of the oil pan base.

NOTE: If the oil pan is replaced, reuse the cleaned magnet.

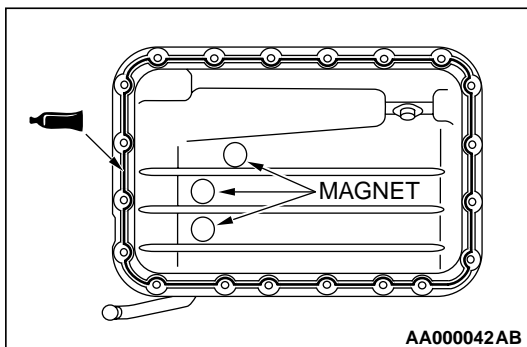
4. Apply sealant around the gasket surface of the oil pan as specified in the illustration.

Specified sealant: MITSUBISHI GENUINE PART number MD166584 or equivalent

NOTE: The sealant should be applied in a continuous bead approximately 3 mm (0.1 inch) in diameter.

5. Tighten the mounting bolts to the specified torque.

Tightening torque: 11 ± 1 N·m (98 ± 8 in-lb)



TRANSMISSION FLUID COOLER, HOSE, PIPE

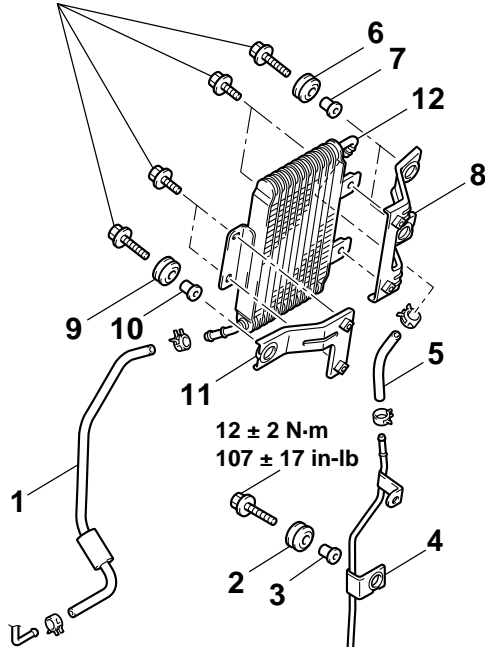
REMOVAL AND INSTALLATION

M1231118400091

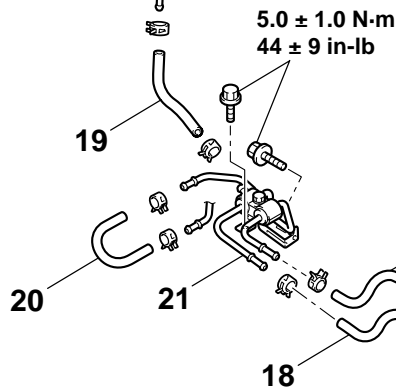
Pre-removal and Post-installation Operations

- Transmission Fluid Draining and Refilling (Refer to [P.23Aa-16.](#))
- Skid Plate and Under Cover Removal and Installation
- Radiator Grille Removal and Installation (Refer to Group 51 – Front Bumper [P.51-3.](#))

12 ± 2 N-m
107 ± 17 in-lb

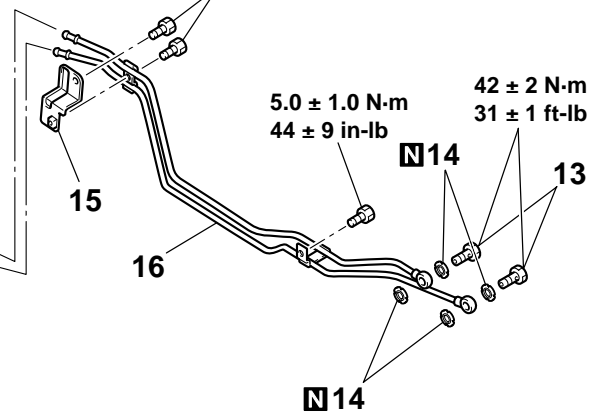


12 ± 2 N-m
107 ± 17 in-lb



5.0 ± 1.0 N-m
44 ± 9 in-lb

5.0 ± 1.0 N-m
44 ± 9 in-lb



5.0 ± 1.0 N-m
44 ± 9 in-lb

42 ± 2 N-m
31 ± 1 ft-lb

AC000031AB

TRANSMISSION FLUID COOLER REMOVAL STEPS

1. HOSE
2. BUSHING
3. DISTANCE PIECE
4. TRANSMISSION FLUID RETURN TUBE
5. HOSE

TRANSMISSION FLUID COOLER REMOVAL STEPS

- HEADLIGHT ASSEMBLY (REFER TO GROUP 54A [P.54A-71.](#))
- 6. BUSHING
- 7. DISTANCE PIECE

**TRANSMISSION FLUID
COOLER REMOVAL STEPS**

8. TRANSMISSION FLUID COOLER
BRACKET
9. BUSHING
10. DISTANCE PIECE
11. TRANSMISSION FLUID COOLER
BRACKET
12. TRANSMISSION FLUID COOLER

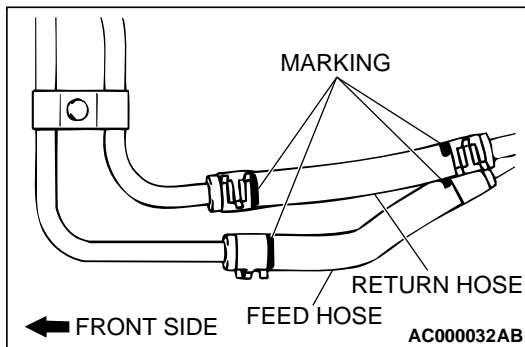
**TRANSMISSION FLUID
COOLER TUBE ASSEMBLY
REMOVAL STEPS**

- >>B<< 13. EYE BOLT
- >>B<< 14. GASKET
- >>B<< 15. TRANSMISSION FLUID COOLER
TUBE BRACKET
- >>B<< 16. TRANSMISSION FLUID COOLER
TUBE ASSEMBLY
- >>A<< 17. RETURN HOSE
- >>A<< 18. FEED HOSE
19. HOSE
20. HOSE
21. TRANSMISSION FLUID COOLER
TUBE ASSEMBLY

INSTALLATION SERVICE POINTS

>>A<< FEED HOSE/RETURN HOSE INSTALLATION

Install the feed hose and return hose so that the markings are positioned as shown in the illustration.

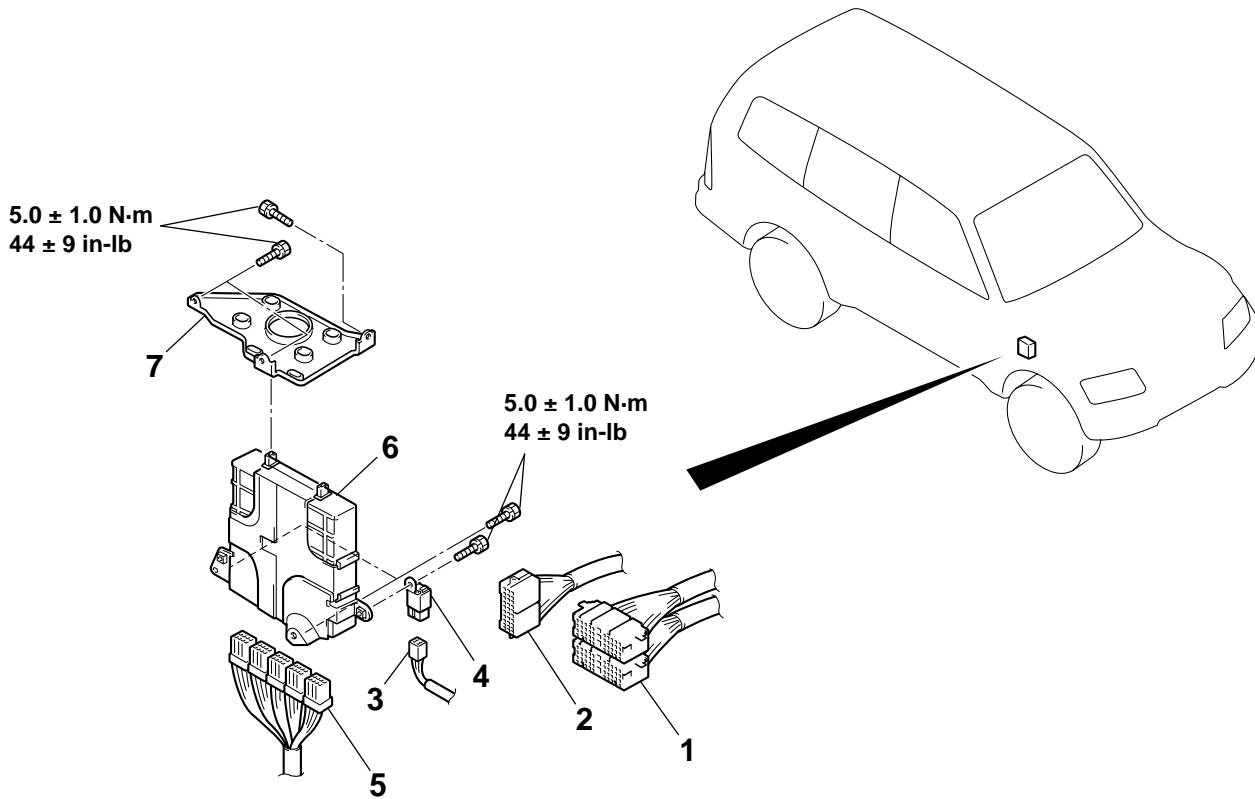


**>>B<< TRANSMISSION FLUID COOLER TUBE ASSEMBLY/
TRANSMISSION FLUID COOLER TUBE BRACKET/
GASKET/EYE BOLT INSTALLATION**

Temporarily tighten the eye bolts onto the transmission and temporarily secure the pipes with the clamps, and then fully tighten the eye bolts. Then tighten the clamps in order starting from the one closest to the transmission.

POWERTRAIN CONTROL MODULE (PCM)**REMOVAL AND INSTALLATION**

M1231121600062



AC204613AC

REMOVAL STEPS

- COWL SIDE TRIM <RH> (REFER TO GROUP 52A, TRIM [P.52A-8.](#))
- 1. INSTRUMENT PANEL HARNESS AND FRONT DOOR HARNESS <RH> CONNECTION
- 2. INSTRUMENT PANEL HARNESS AND FLOOR HARNESS <RH> CONNECTION
- 3. A/T CONTROL RELAY CONNECTOR
- 4. A/T CONTROL RELAY

REMOVAL STEPS (Continued)

- 5. POWERTRAIN CONTROL MODULE CONNECTOR
- 6. POWERTRAIN CONTROL MODULE (PCM)
- INSTRUMENT PANEL ASSEMBLY (REFER TO GROUP 52A, INSTRUMENT PANEL ASSEMBLY [P.52A-2.](#))
- 7. POWERTRAIN CONTROL MODULE (PCM) BRACKET

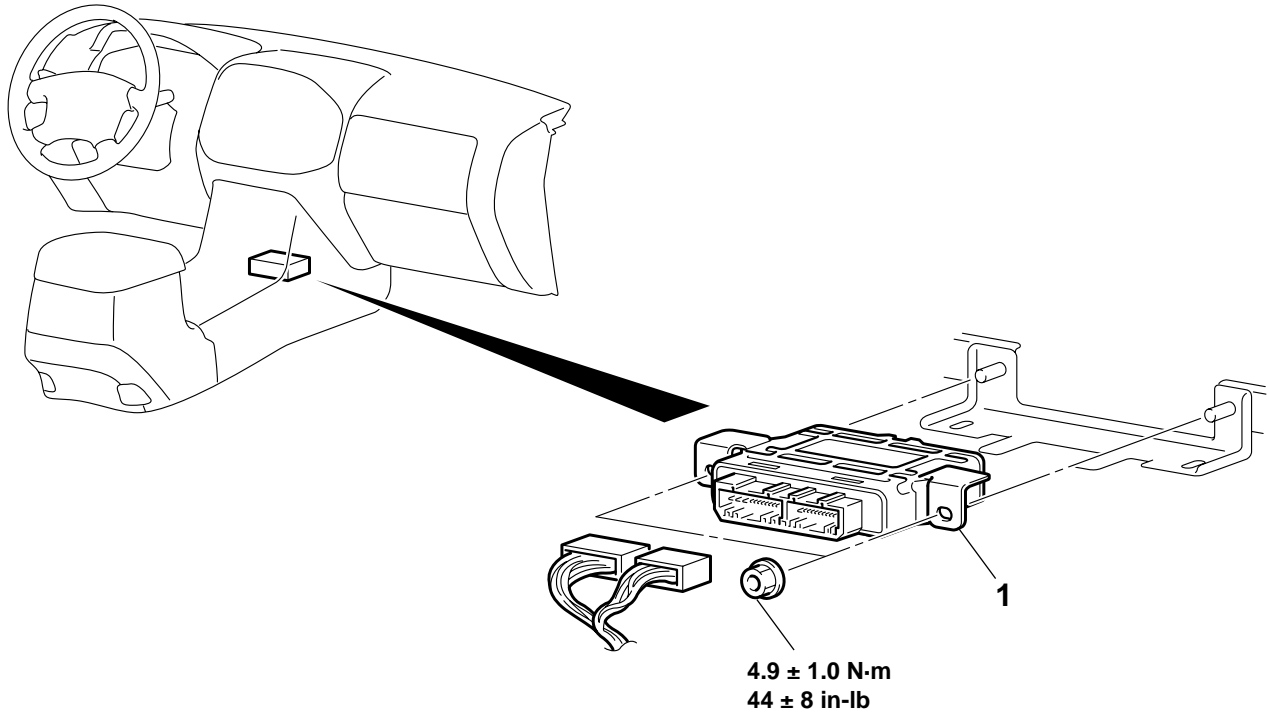
TRANSFER-ECU

REMOVAL AND INSTALLATION

M1231102400036

Pre-removal and Post-installation Operations

Indicator panel, floor console panel removal and installation
(GROUP 52A – Floor Console [P.52A-7.](#))



AC204337AB

TRANSFER-ECU REMOVAL

1. TRANSFER-ECU

SPECIFICATIONS**FASTENER TIGHTENING SPECIFICATION**

M1231104700129

ITEM		SPECIFICATION
Oil pan		
Oil pan		11 ± 1 N·m (98 ± 8 in-lb)
Powertrain control module (PCM)		
Powertrain control module (PCM)		5.0 ± 1.0 N·m (44 ± 8 in-lb)
Powertrain control module (PCM) bracket		5.0 ± 1.0 N·m (44 ± 8 in-lb)
Shift lock cable unit		
Shift lock cable unit		5.0 ± 1.0 N·m (44 ± 9 in-lb)
Transfer		
Transfer oil filler plug		32 ± 2 N·m (24 ± 1 ft-lb)
Transfer oil drain plug		32 ± 2 N·m (24 ± 1 ft-lb)
Transfer-ECU		
Transfer-ECU		4.9 ± 1.0 N·m (44 ± 8 in-lb)
Transmission assembly		
Transmission fluid drain plug		39 ± 5 N·m (29 ± 3 ft-lb)
Cover		11 ± 1 N·m (98 ± 8 in-lb)
Dynamic damper (left side)		35 ± 6 N·m (26 ± 4 ft-lb)
Dynamic damper (right side)		36 ± 6 N·m (27 ± 5 ft-lb)
Eye bolt		5.0 ± 1.0 N·m (44 ± 9 in-lb)
Transmission fluid dipstick guide (engine side)		24 ± 4 N·m (18 ± 3 ft-lb)
Transmission fluid dipstick guide (transmission side)		44 ± 8 N·m (33 ± 5 ft-lb)
Oil cooler tube mounting bolt	Eye bolt	42 ± 2 N·m (31 ± 1 ft-lb)
	M6 bolt	5.0 ± 1.0 N·m (44 ± 9 in-lb)
Oil pan mounting bolt		36 ± 5 N·m (26 ± 4 ft-lb)
Starter		30 ± 3 N·m (22 ± 2 ft-lb)
Starter harness connection nut		11 ± 1 N·m (98 ± 8 in-lb)
Tension wire		24 ± 5 N·m (18 ± 3 ft-lb)
Tension wire bracket		53 ± 5 N·m (39 ± 4 ft-lb)
Torque converter and drive plate connection bolt		49 ± 3 N·m (36 ± 2 ft-lb)
Transmission assembly		89 ± 9 N·m (66 ± 6 ft-lb)
Transmission mount insulator assembly	Bolt	44 ± 10 N·m (33 ± 7 ft-lb)
	Nut	26 ± 4 N·m (19 ± 7 ft-lb)
Transmission mount center member assembly		44 ± 10 N·m (33 ± 7 ft-lb)
Transmission control		
Bracket to selector lever assembly		11 ± 2 N·m (98 ± 17 in-lb)
Detent plate assembly		4.9 ± 1.0 N·m (44 ± 8 in-lb)
Detent spring		2.5 ± 0.4 N·m (22 ± 4 in-lb)
Selector lever assembly		11 ± 2 N·m (98 ± 17 in-lb)
Shift lock cable unit		5.0 ± 1.0 N·m (44 ± 9 in-lb)

ITEM	SPECIFICATION
Transfer shift lever to bracket	5.0 ± 1.0 N·m (44 ± 9 in-lb)
Transmission control cable adjusting nut	23 ± 4 N·m (17 ± 3 ft-lb)
Transmission control harness connection bolt	11 ± 2 N·m (98 ± 17 in-lb)
Transmission range switch mounting bolt	11 ± 1 N·m (98 ± 8 in-lb)
Universal joint	13 ± 2 N·m (115 ± 18 in-lb)
Transmission oil cooler	
Bushing	12 ± 2 N·m (107 ± 17 in-lb)
Eye bolt	42 ± 2 N·m (31 ± 1 ft-lb)
Transmission oil cooler bracket	12 ± 2 N·m (107 ± 17 in-lb)
Transmission oil cooler tube assembly	5.0 ± 1.0 N·m (44 ± 9 in-lb)
Transmission oil cooler tube bracket	5.0 ± 1.0 N·m (44 ± 9 in-lb)

SERVICE SPECIFICATION

M1231100300107

ITEMS	STANDARD VALUE	
Line pressure MPa (psi)	1.01 – 1.05 (147 – 152)	
Transmission fluid temperature sensor kΩ	at 0°C (32°F)	16.7 – 20.5
	at 20°C (68°F)	7.3 – 8.9
	at 40°C (104°F)	3.4 – 4.2
	at 60°C (140°F)	1.9 – 2.2
	at 80°C (176°F)	1.0 – 1.2
at 100°C (212°F)	0.57 – 0.69	
Resistance of torque converter clutch control solenoid valve coil [at 20°C (68°F)] Ω	2.7 – 3.4	
Resistance of low-reverse/direction solenoid valve coil [at 20°C (68°F)] Ω	2.7 – 3.4	
Resistance of second solenoid valve coil [at 20°C (68°F)] Ω	2.7 – 3.4	
Resistance of underdrive solenoid valve coil [at 20°C (68°F)] Ω	2.7 – 3.4	
Resistance of overdrive solenoid valve coil [at 20°C (68°F)] Ω	2.7 – 3.4	
Resistance of reduction solenoid valve coil [at 20°C (68°F)] Ω	2.7 – 3.4	
Stall speed r/min	2,200 – 2,700	

LUBRICANTS

M1231100400126

ITEM	SPECIFIED LUBRICANT	SPECIFICATION
Automatic transmission fluid dm ³ (qt)	DIAMOND ATF SP III or equivalent	9.7 (10.2)
Transfer oil dm ³ (qt)	Gear oil SAE 75W-90 or 75W-85W conforming to API classification GL-4	2.8 (3.0)

SEALANT AND ADHESIVE

M1231100500112

ITEM	SPECIFIED SEALANT AND ADHESIVE
Oil pan	
Oil pan	MITSUBISHI GENUINE Part No. MR166584 or equivalent
Transmission control	

ITEM	SPECIFIED SEALANT AND ADHESIVE
Gasket	3M™ AAD part No.8663 or equivalent
Stopper plate	
Transfer control lever mounting bolt	3M™ AAD part No.8730 or equivalent